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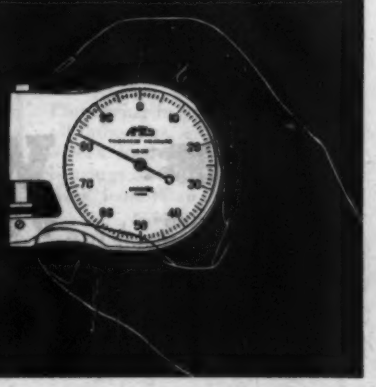

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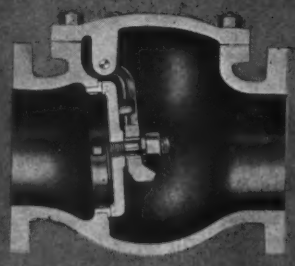

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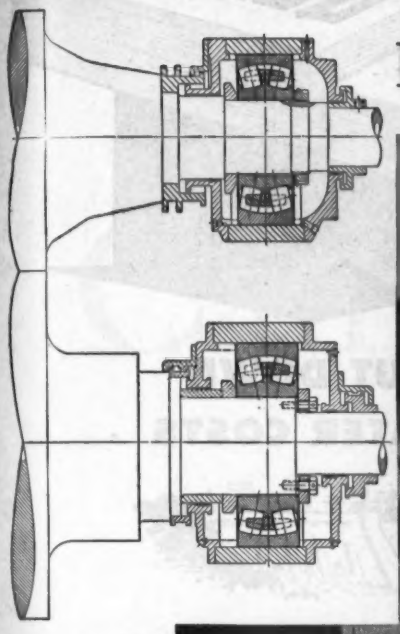

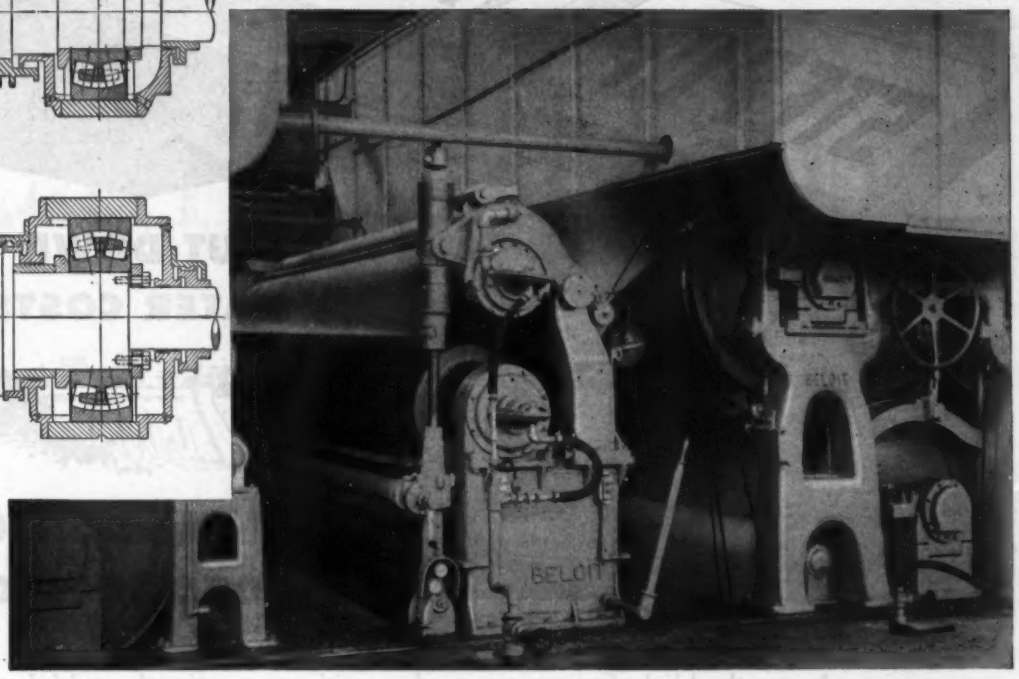

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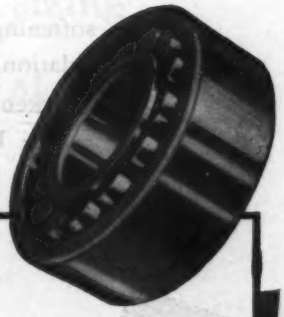

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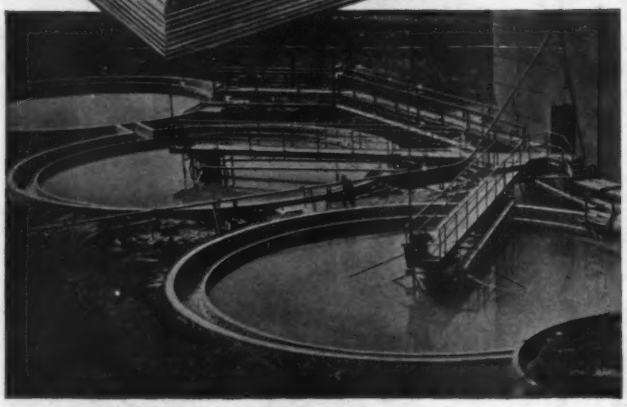

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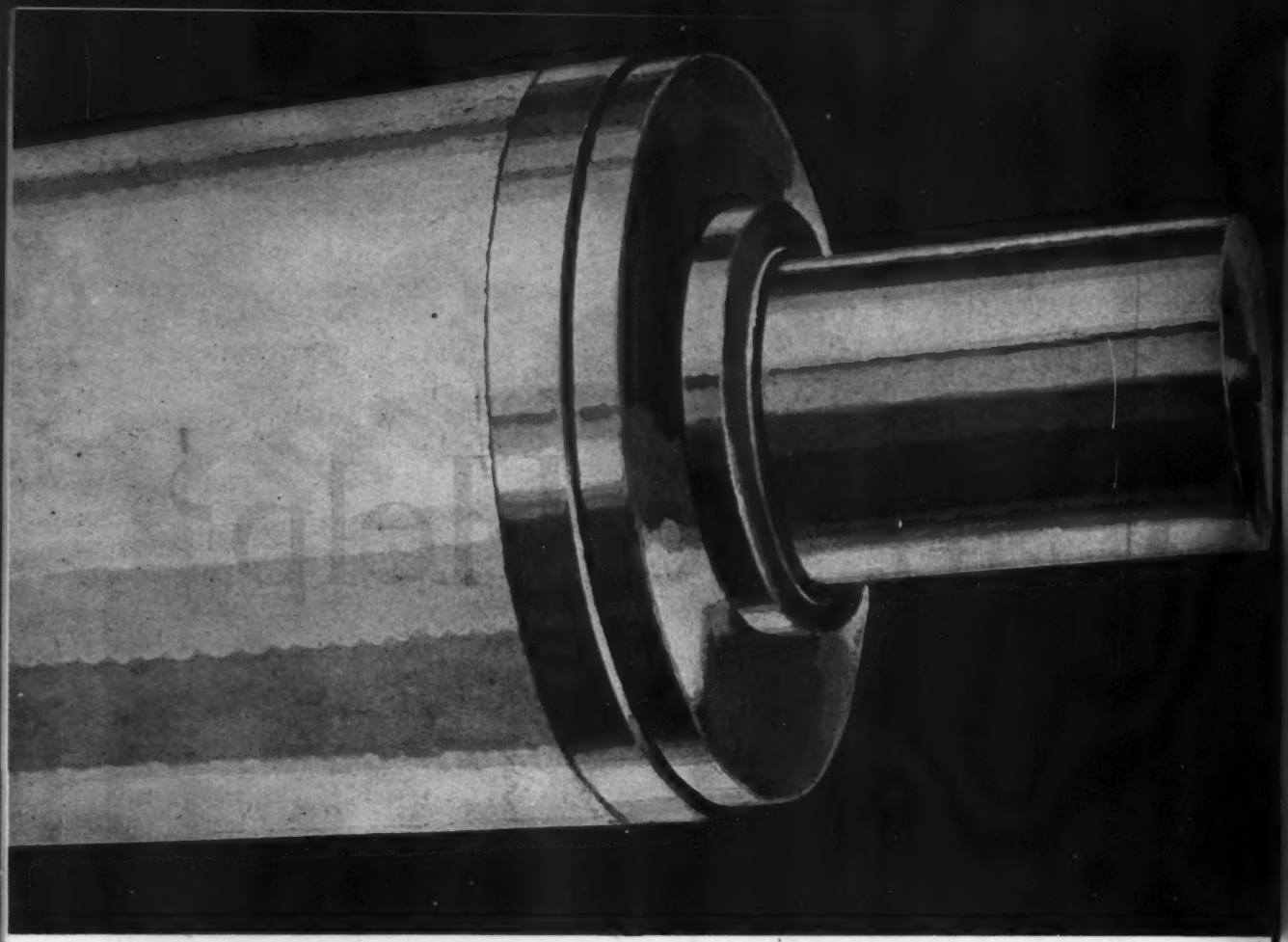

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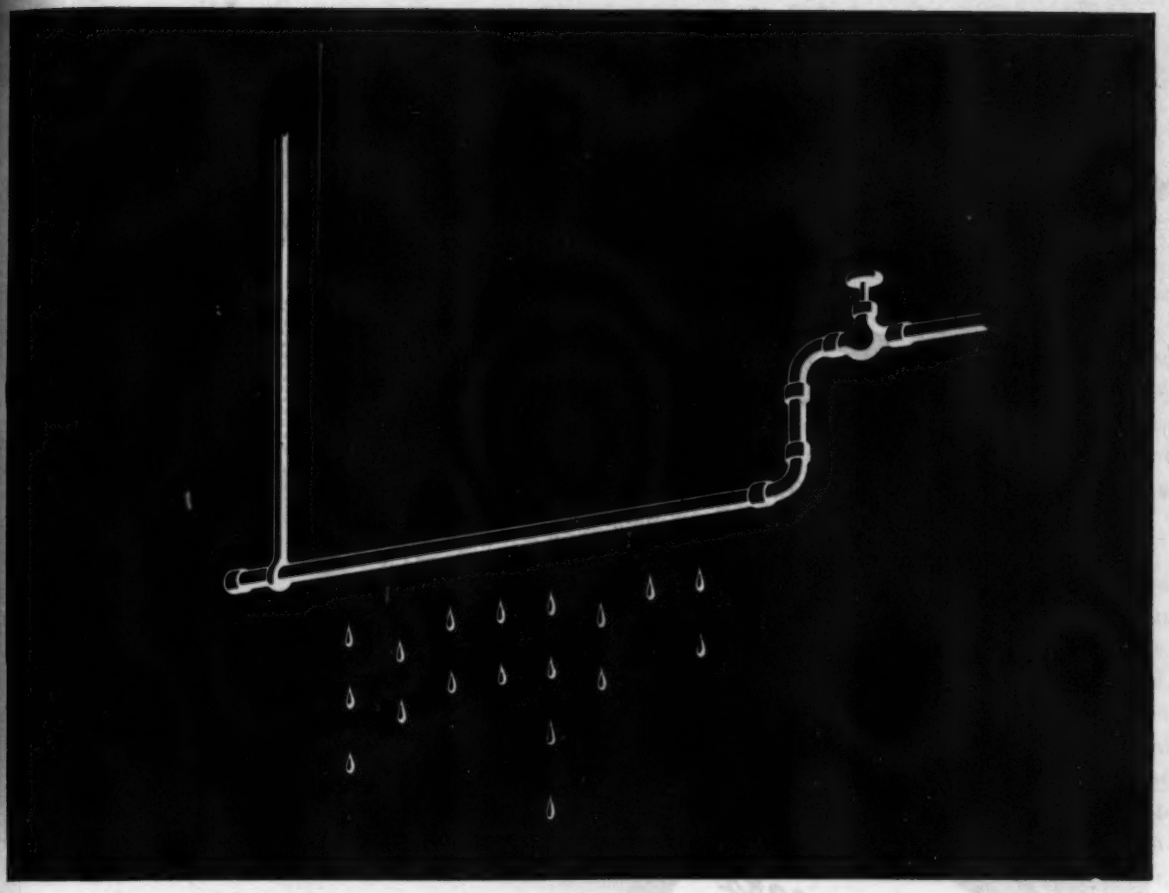

As simple as this to preserve laps

All that is required to preserve laps in the average pulp mill is a gadget like that shown above: a perforated pipe, a control valve and a suspended tank to gravity-feed a solution of "Lignasan" on the sheets as they pass over the wet machine.

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Protect stored laps and slush pulp too, with "Lignasan." From 4 to 8 ounces per ton of fiber, dry basis, offer protection against spoilage.

Get the facts today on how "Lignasan" can help increase production and cut costs in *your* mill. Write our nearest office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

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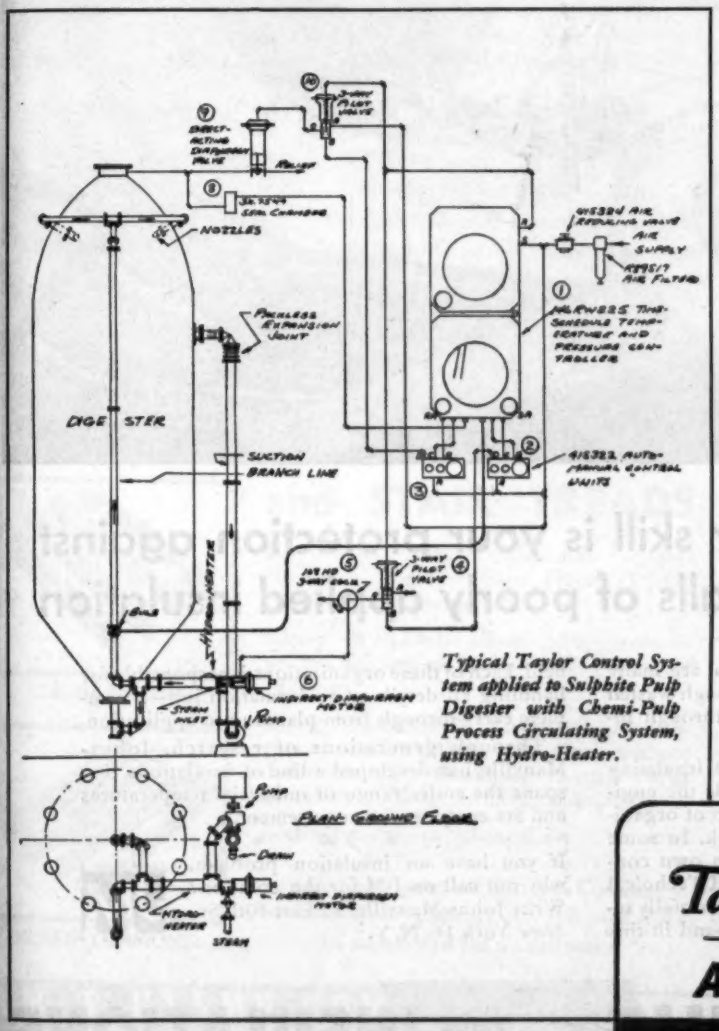
These systems include the new improved Taylor Fulscope Time Schedule Controller, control valves for the steam supply line and relief line, automatic-to-manual control station, signal light arrangement, and other accessories as shown in the drawing.



Typical Taylor Control System applied to Sulphite Pulp Digester with Chemi-Pulp Process Circulating System, using Hydro-Heater.

Where indirect tubular heaters were used, we also furnished ball float type condensate level controllers. Where Hydro-Heaters were used, we furnished a specially designed reverse-acting air motor connected directly to the adjusting stem of the Hydro-Heater. On two of the installations we furnished separate desuperheater controls for each digester.

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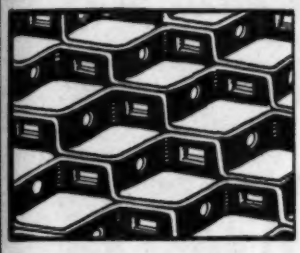

Makes stronger floors that last! Easily laid over old or new floors (concrete or wood base) and filled flush with concrete or asphalt. Exposed tops of heavy steel grid bear loads. Level non-skid surface cannot crack, rut, nor pocket. For heaviest traffic and loads! (See Alton Box Company's Klemp installation to right.)

Klemp Hexteel Installation at plant of Alton Box Co., Alton, Ill.

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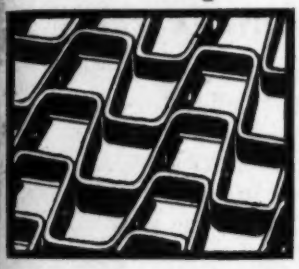

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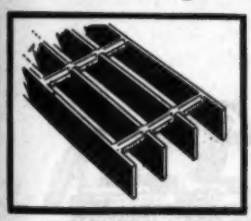
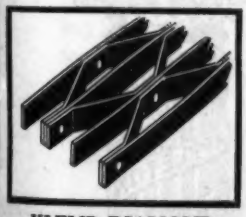


KLEMP WELDED



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Klemp Diamond Riveted Grating Installation at plant of Champion Coated Paper Co., Hamilton, O.

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3-Ply Leather Belt

The outstanding performance of the FLEXOCONE Belt, here illustrated in one of America's prominent paper mills, is a *material* demonstration of the soundness of the engineering *principles* upon which its design and construction are based.

In a cone drive, the greatest stress on the belt is in a diagonal line. The FLEXOCONE 3-Ply Leather Belt is constructed with the sections of leather in each ply arranged in proper position to resist with maximum strength the actual stress of taper cone pulley operation.

FLEXOCONE Belts decrease belt cost per unit of production by assuring longer belt life; operate with less tension; can be made endless and repaired on the job.

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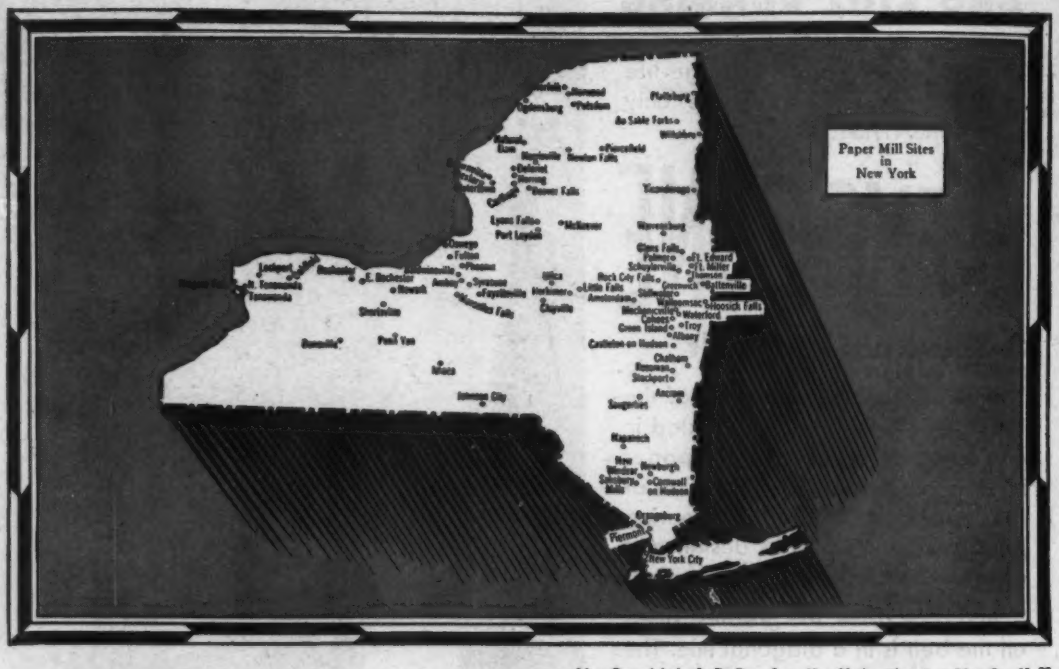

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HIGH LIGHTS: The foundation stones of Henry Onderdonk's property on Sliver Lake, near Hempstead Harbor, Long Island, are all that remain of New York's first paper mill. A marker should be placed on the spot dated 1773. It might also state — "George Washington made paper here on April 24, 1790."

The Father of his Country, thus unwittingly commemorated the 100th anniversary of American papermaking. He was sufficiently impressed to record in his diary that he was "kindly entertained" at breakfast by Mr. Onderdonk, who "works a grist mill and two paper mills, the last of which he seems to carry on with spirit and profit." Unfortunately the cherished sheets which Washington made have been lost.

The progress of papermaking in New York, following its watercourses, spread all over the eastern and northerly parts of the State. Its products exceed those of all the earlier pioneers, and none have yet surpassed New York in the production of paper, although Maine, Washington and Wisconsin, in the order named, produce more wood pulp.

The Department of Pulp & Paper Manufacture of the New York State College of Forestry on the campus of Syracuse University, established 1918, was the second institution of technical education for this purpose in the United States.

New York produces about one and one-half million tons of paper annually on the following equipment: 122 paper mills and 30 pulp mills. 115 cylinder machines, 108 Fourdriniers, 12 Yankees, 133 wet machines.

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CAMACHINE 20 is easy to thread and in running handles the web gently, resulting in fewer web breaks.

Automatic counterweighting of both riding roller and rewind shaft assures the good, firm start necessary for winding rolls of uniform density from the core out.

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Add to this our non-stop application of lessons learned through 99 years of practical experience and you have the Powell Line—a complete line of valves of every type and material needed to satisfy all flow-control requirements of industry today. And tomorrow, as new demands arise, there'll be Powell Valves to meet them.

Fig. 9061WE—Class 900-pound Cast Steel Swing Check Valve, with welding ends and bolted cap. Disc is hung on a 5-degree angle, and when wide open permits full, unobstructed flow through the valve body.

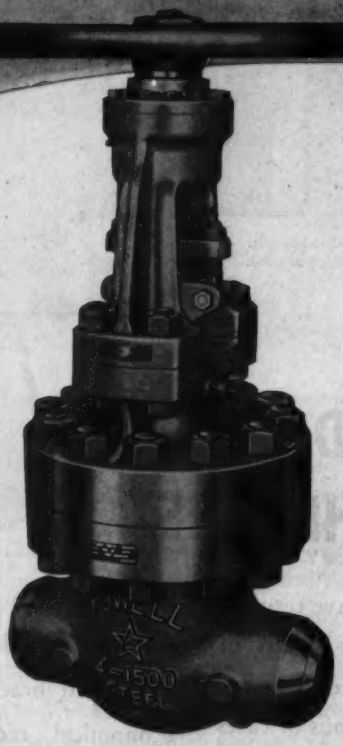


Fig. 1303 WE—Class 1500-pound Cast Steel Gate Valve, with welding ends, outside screw rising stem, bolted flanged yoke and taper solid wedge.

Fig. 6031—Class 600-pound Cast Steel Globe Valve, with flanged ends, outside screw rising stem and bolted flanged yoke.

The Wm. Powell Co.

Dependable Valves Since 1846

Cincinnati 22, Ohio

Above: Floating load of skids braced with Acme Unit-Load Bands.
Inset: Carload of rolls braced with the Acme "Skid Check" method.

HOW ACME UNIT-LOAD BAND SERVES PAPER SHIPPERS

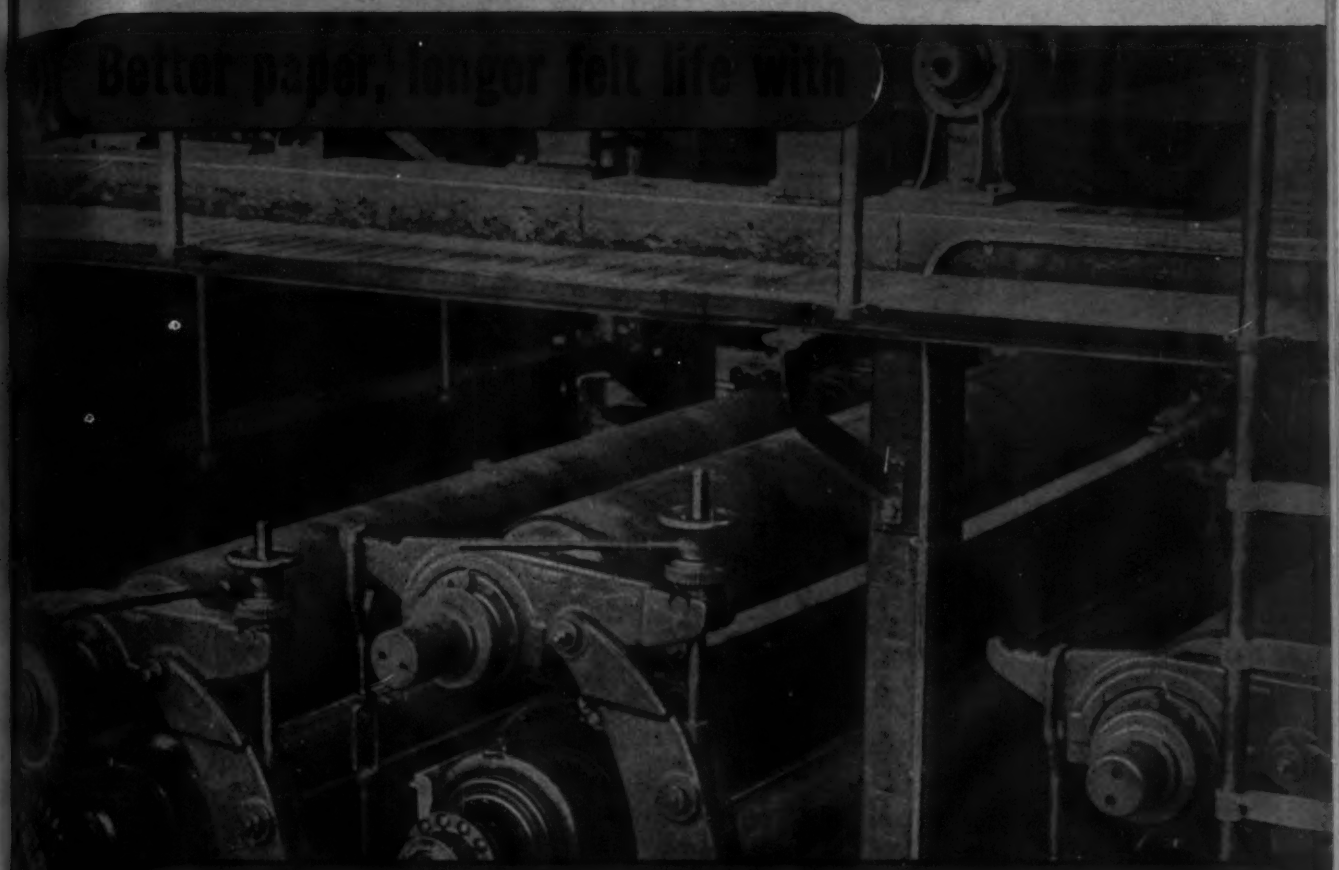
Years of study by Acme Engineers have resulted in safe bracing methods for every variety of paper shipment by rail. Regardless of unit . . . whether skidloaded, or in rolls, cartons or cases . . . straight or pool cars . . . an Acme Unit-Load method has been evolved, tested, and stamped with the approval of paper shippers everywhere.

As the industry serves its customers by furnishing paper manufactured to unrelenting standards of quality, Acme Unit-Load Bands serve the paper field in the same dependable way by insuring safe delivery of product. And Acme Unit-Load bracing methods are practical and economical, requiring little or no dunnage, and enabling faster loading and unloading.

Acme Unit-Load Band, though helping Uncle Sam "Pack It Right to Reach the Fight," is still available to make your skids and rolls of paper "Bound to Get There."

ACME STEEL COMPANY
CHICAGO 8, ILLINOIS, 2818 ARCHER AVENUE

ACME STEEL CO.
CHICAGO



Smooth, uniform, trouble-free! That's characteristic of MANHATTAN Rubber Covered Rolls.

The continuous delivery from the wet end; the uniform lay of paper on the felt; the perfect nip—all are the natural result of accurate grinding and finishing, the uniform and exact density of FLEXLASTICS covering, the vulcanizing to laboratory accuracy and the complete bonding of cover to metal to give you longer life and greater durability in MANHATTAN Rubber Covered Rolls.

The combination of engineering research with seasoned workmanship gives you a uniform, steady production, consistent high quality, regardless of the kind of paper.

When next your rolls need recovering, consult MANHATTAN and profit by more than half a century of experience.

The term FLEXLASTICS is an exclusive MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.

9 ADVANTAGES

1. Coverings adhere inseparably to metal shell.
2. FLEXLASTICS coverings will not oxidize or surface harden.
3. May be held in storage without deterioration or change of any kind.
4. Corrugating and checking virtually eliminated.
5. Uniform surface qualities and resiliency.
6. Resist abrasion and acidity.
7. Make felts last longer.
8. Increase production and overall quality.
9. Reduce manufacturing and maintenance costs.

Other MANHATTAN PRODUCTS

Compensated Belt	Acid Hose	Molded Rubber Goods
Endless Cord Belts	Fire Hose	Oilless Bearings
Conveyor and Elevator Belt	Steam Hose	Screen Diaphragms
V-Belt	Suction Hose	Rubber Lined Tanks
Agricultural Belt	Water Hose	Printing Ink Rollers
Air Hose	Paper Mill Hose	Abrasive Wheels

THE MANHATTAN RUBBER MANUFACTURING DIVISION
OF RAYBESTOS-MANHATTAN, INC.
EXECUTIVE OFFICES AND FACTORIES

B. F. PERKINS & SON, Inc.

HOLYOKE, MASS., U.S.A.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

Successful Combinations

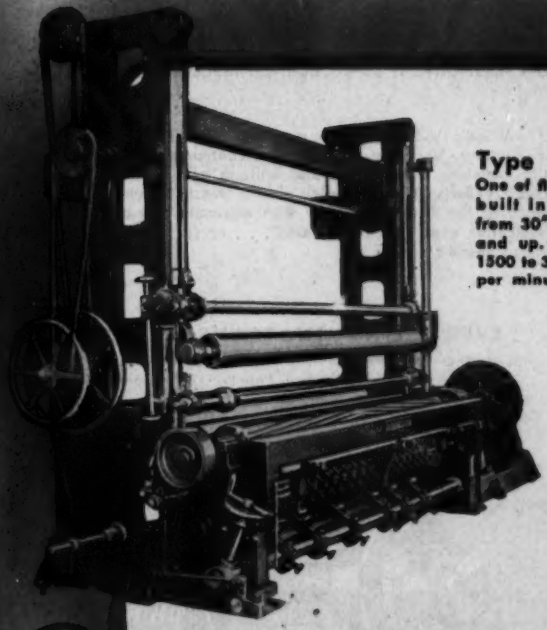
Bread and Butter just naturally go together to make a satisfying whole . . . and no less successful is the combination of skilled craftsmen and Langston machines.

Like many other nationally known concerns The Paterson Parchment Paper Company of Bristol, Pa., uses Langston Slitters and Roll Winders, in making their famous "Patapar" vegetable parchment.

Wherever paper is processed; in the mill, the finishing room, or the paper converting plant, Langston Slitters and Roll Winders are giving dependable, trouble-free service.

SAMUEL M. LANGSTON COMPANY

CAMDEN, NEW JERSEY



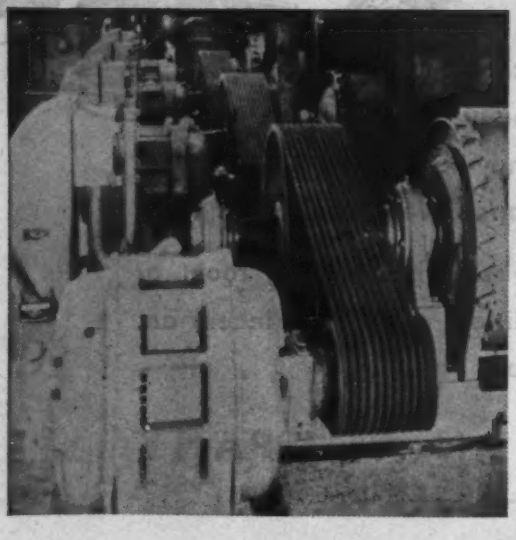
Type "CA"
One of five types built in widths from 30" to 263" and up. Speeds, 1500 to 3000 feet per minute.

Standard roll of Patapar Vegetable Parchment—boil-proof and grease-resisting.

Langston

★ SLITTERS AND ROLL WINDERS ★

SILENT DEPENDABLE ECONOMICAL...



Wood's V-BELT DRIVES *for* PAPER MILLS

Precision design and construction characterize this ideal power transmission unit. Soundly engineered, fabricated from superior materials, the silent, dependable Wood's V-Belt drive is an economical investment because—

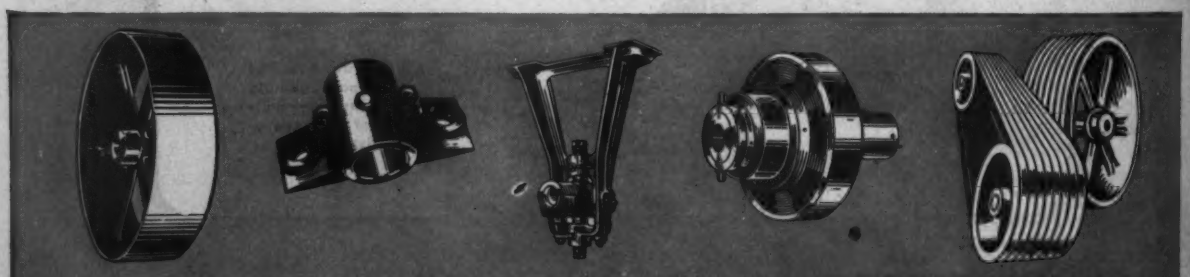
1. Wood's precision V-groove sheaves have perfectly designed grooves, accurately machined to gauges for width, depth and angle. They are uniformly spaced and conform to standards set in the industry. Wood's are the oldest builders of cast iron pulleys. The proportions of rim, hubs and arms developed through years of experience in the design and manufacture of pulleys, have helped Wood's to produce the best type of V-groove sheave.

2. Wood's V-Belts are full molded, resilient and flexible . . . extremely accurate in design. The fact that horsepower requirements utilize only a small percentage of the ultimate strength of these belts—ruggedly constructed of the strongest materials—accounts for their extremely long life.

3. Wood's V-Belts and sheaves are *engineered to work together.* Since the proper groove contour of the sheave permits complete belt contact and uniform seating of the "tailor made" V-Belts, Wood's V-Belt drives transmit energy from its source to the driven machinery with maximum efficiency. Engineering consultation welcomed . . . or see your conveniently located Wood's dealer.

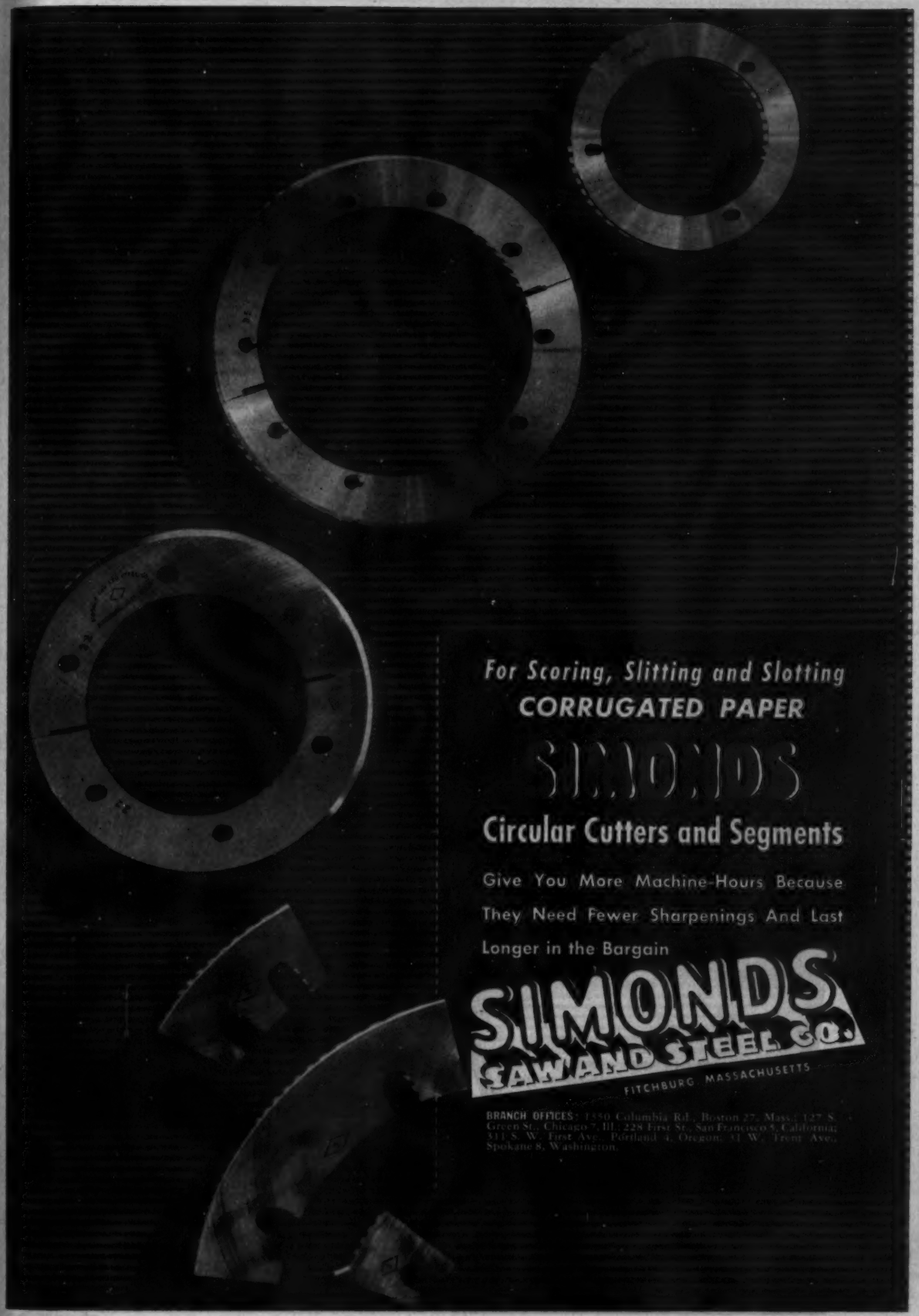
EVERYTHING IN TRANSMISSION

Bearings - Collars - Clutches - Couplings - Contactors - Hangers - Pillow Blocks - Pulleys - V-Belt Sheaves and Complete Drives



T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

Branches: BOSTON, MASS. NEWARK, N. J. PITTSBURGH, PA. CLEVELAND, OHIO DETROIT, MICH. HOUSTON, TEXAS


For Scoring, Slitting and Slotting
CORRUGATED PAPER
SIMONDS
Circular Cutters and Segments
Give You More Machine-Hours Because
They Need Fewer Sharpenings And Last
Longer in the Bargain
SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASSACHUSETTS
BRANCH OFFICES: 1550 Columbia Rd., Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 228 First St., San Francisco 5, California; 511 S. W. First Ave., Portland 4, Oregon; 31 W. Trent Ave., Spokane 8, Washington.

WEST COAST HEMLOCK PULP

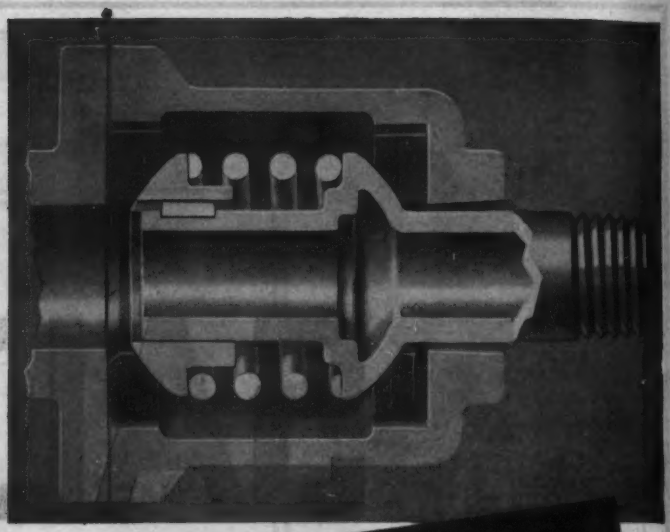
HARVESTING of mature virgin timber for lumber and Weyerhaeuser bleached sulphite pulp requires the planned projection of new track for the logging railroad.

PULP DIVISION ✦ WEYERHAEUSER TIMBER COMPANY

SALT CAKE

PRIOR CHEMICAL CORPORATION - NEW YORK
420 LEXINGTON AVENUE
Chicago Office: 230 N. Michigan Ave.

High quality, free-flowing material available for shipment by rail or water from strategic points located in the East, Middle West, and on the Gulf Coast.



47 second quiz on . . .

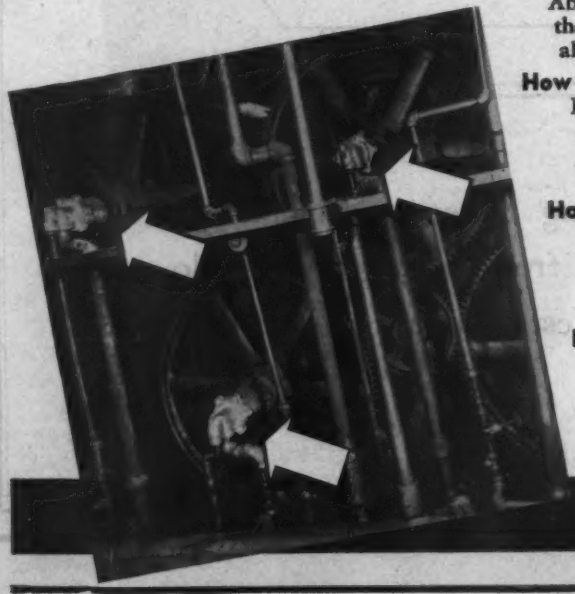
JOHNSON *Rotary Pressure* JOINTS

What is the Johnson Rotary Pressure Joint?
It's the modern, engineered way to get steam in, and condensate out of, paper machines, calenders and corrugators.

How does it differ from ordinary stuffing boxes?
Briefly, in the way it helps to boost production and ends all the time and money-wasting troubles of stuffing boxes.

No packing or oiling?
Absolutely none! What's more it's self-adjusting as well, and the unique design provides for both lateral and angular misalignment.

Write for complete literature



How does it boost production?
Partly by eliminating so many causes of machinery shutdown. Partly by facilitating more efficient methods of syphon roll drainage. Partly by releasing precious man-hours for more productive work.

How does the paper industry feel about it?
Few ideas have ever caught on so fast. Though introduced barely ten years ago, Johnson Joints have since been installed in hundreds of mills. All in all, there are more than 85,000 in service today.

How much does it cost to switch over?
In a few words: It doesn't cost—it pays! The increased plant efficiency alone would make the Johnson Joints a good investment, yet the savings in maintenance can quickly pay the cost of changing over.

The Johnson Corporation

828 WOOD STREET THREE RIVERS, MICH.

PLURAMELT..YOUNGSTER WITH A FUTURE

TODAY, Pluramelt products are entirely allocated for essential purposes. In fabricated form, they're serving in mess trays aboard ship—in field ranges—in kitchen and hospital equipment for the services—in the manufacture of synthetic rubber, high-octane gas, explosives, etc. The list includes both the single and double stainless-armored types.

In each case, of course, Pluramelt is used instead of *solid* stainless steel. The chief reason, therefore, is the very important matter of conservation. Pluramelt saves 60% to 80% of the vital chromium and nickel that solid stainless would consume for the same job.

But there are other prime considerations. Pluramelt in general fabricates easier than solid stainless steel. And, under any conditions of fabrication and subsequent service, it does not—*cannot*—come apart. Pluramelt is unique—a controlled composite steel with an *intermelted* bond that cannot be separated.

Do you want to know more about this stainless-armored steel that is so sure to bulk large in the peacetime manufacturing of the future? Let us work with your engineers and design men to explore the possibilities of Pluramelt in your plans and products.

ADDRESS DEPT. PT-33

Allegheny Ludlum
STEEL CORPORATION
BRACKENRIDGE, PENNSYLVANIA

W & D A-9341

THE TREND TO *Light-weight* STARTED HERE

REMEMBER your first experience with TITANOX pigments? Remember how you found in them the answer to many of your paper-making problems — how you attained whiter, brighter paper stocks with a minimum of pigment—and opacity such as you never before had achieved?

Then came the order to conserve. Lighter-weight stocks? Why not? TITANOX would give them the necessary opacity. So you came through with light-weight papers that have served well in the all-out effort to make the most of available raw materials.

You met a challenge and in doing so you started a trend — a trend toward new appreciation of the many advantages deriving from the use of light-weight papers. For, aside from the saving in raw materials, the train of economies set up by these thinner papers was considerable . . . lower shipping costs . . . less storage space . . . reduced mailing costs.

Thus light-weight papers were welcomed in many fields — to such an extent, indeed, that you now feel justified in expecting the demand to continue after the emergency has passed.

Our Technical Service Department will welcome the opportunity to help you in your post-war planning.

TITANOX

REG U.S. PAT. OFF.

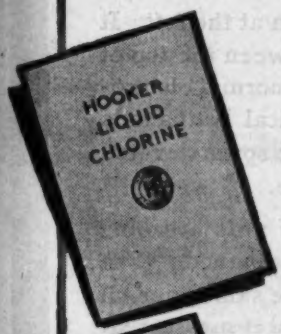
TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York 6, N. Y.
104 South Michigan Ave., Chicago 3, Ill.
350 Townsend St., San Francisco 7, Cal.
2472 Enterprise St., Los Angeles 21, Cal.

The Chemicals You Need...
Quality You Can Depend on... from Hooker

Hooker Liquid Chlorine... Hooker has been providing high quality, high purity liquid chlorine to pulp and paper makers for years. The uniformly dependable supplies of Hooker Liquid Chlorine, even during this critical period, have helped the pulp and paper making industry to maintain high quality of product under handicapping conditions.

Hooker Liquid Chlorine, of consistently high purity, is available in tank cars containing 16 and 30 tons, multi-unit cars containing 15 one-ton containers and in cylinders containing 100 and 150 lbs.

Hooker Caustic Soda... Hooker Caustic Soda is produced in our well-known and now nationally used Hooker type "S" electrolytic cells. It is of the same high purity and uniformity as other Hooker Chemicals. The flake form is shipped in drums of 100 or 400 lbs., the solid forms in drums of 220 or 700 lbs., and the liquid 50% and 70% solutions are shipped in drums of 700 lbs., or tank cars.



Hooker Bleaching Powder... Hooker Bleaching Powder contains at least 35% available chlorine. It is furnished in drums containing 100, 300 and 800 lbs.

Hooker Muriatic Acid... Hooker Muriatic Acid is a high grade product. Its quality is indicated by its relative freedom from arsenic and sulfates and its extremely low iron content. It is supplied in 13 gallon carboys containing 125 pounds and in tank cars.

Hooker Sodium Sulfide... Hooker Sodium Sulfide is a light salmon yellow colored solid in flake form. It contains 60 to 62% Na_2S. Its high purity is shown by the fact that its iron content is only 10 to 15 ppm. It is shipped in drums containing 90 and 350 pounds.

Hooker's Technical Staff... Along with Hooker's production of Chlorine, Caustic Soda, Bleaching Powder and other chemicals, goes the offer of help on any of your problems involving the use of these chemicals. Hooker's Technical Staff is continuously working with these chemicals and their specialized knowledge is available to help you overcome your difficulties.

Send for These Booklets... Hooker Chlorine and Caustic Soda Booklets contain helpful information on these two chemicals. Physical and chemical specifications, precautions in handling, equipment for storing and shipping, uses and tests are included. Copies sent free of charge when requested on your letterhead.

HOOKER ELECTROCHEMICAL COMPANY

6 Union Street
Niagara Falls, N. Y.

New York, N. Y. Tacoma Wash.
Wilmington, Calif

ARMY (E) NAVY

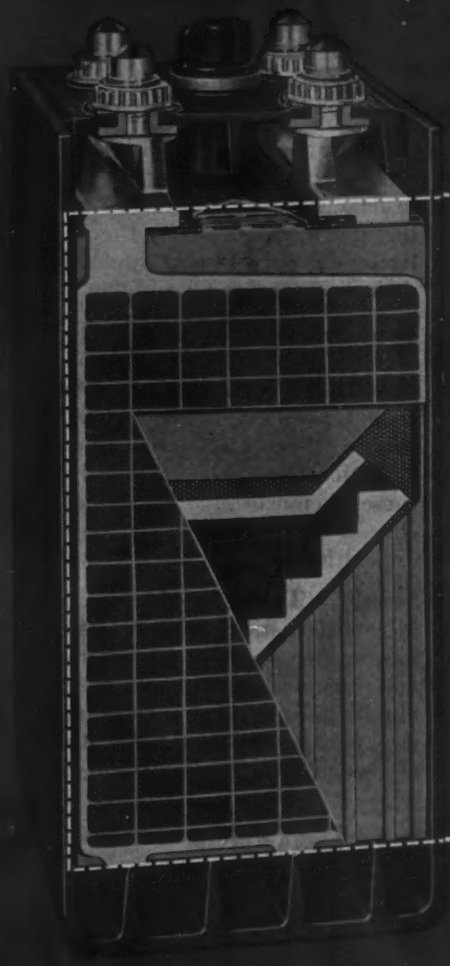
HOOKER CHEMICALS

5263

KATHANODE

HAS MORE WORKING

Electrolyte



GOULD

PIONEER OF GLASSKLAD CONSTRUCTION

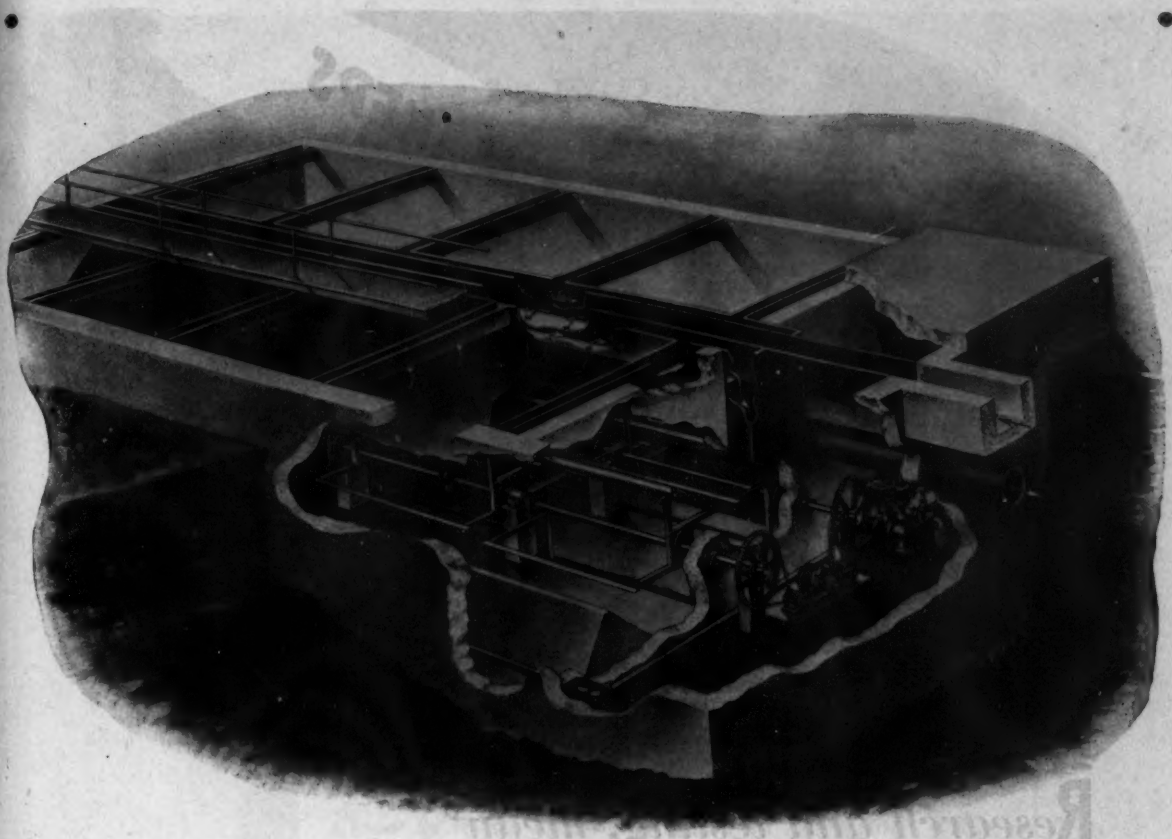
TO DRIVE YOUR ELECTRIC TRUCK *FASTER AND FARTHER!*

You can run your industrial truck farther and faster on a single charge if the batteries are Kathanode.

Look at the diagram at the left. It shows the area between the top of the bridge and the normal electrolyte level in a typical Kathanode battery. This is the space devoted to useful electrolyte.

There is more of this *working electrolyte* in a Kathanode than in any battery of the same over-all dimensions. To you it means that truck speed is sustained, trips are faster and greater in number. It is economical truck operation.

Use battery-powered industrial trucks for outstanding performance in materials handling. Use Kathanode for the best battery power. Write Dept. 57 for Catalog 100 on Gould Kathanode Glassklad Batteries for Industrial Truck and Tractor Service.



If you have a water problem *(and you have!)* . . . here's your solution

Sure you have water problems—what pulp or paper mill hasn't? Permutit* equipment, like the Spaulding Precipitator shown above, solves many of them.

Permutit protects quality of products by removing the dirt, color, iron and other impurities from water supplies.

Permutit White Water Reclaimer recovers fibre and filler more completely than other types of equipment, permits re-use of water, reduces stream pollution.

Plan *now* to get complete control of water quality at your plant . . . regardless of local conditions. Write to: The Permutit Company, Dept. I2, 330 W. 42nd St., New York 18, N. Y. or Permutit Co. of Canada, Ltd., Montreal.

*Trademark Reg. U. S. Pat. Off.

PERMUTIT

WATER CONDITIONING AND CHEMICALS

Rayco Linter Cotton, plus Research and testing, mean Reliability . . .

RAYCO Linter Cotton is virgin (first cut) linters graded by experts, checked by experienced field inspectors, and tested by highly trained technicians in the extensive Railway Supply laboratories. Because of the precision care in packing, handling and shipping every bale of RAYCO Linter Cotton is just like every other bale.

This quality of *reliability* is important to you as a paper maker. It means that when you use RAYCO Linter Cotton as a basic fiber, you lower your variables, and thus have less difficulty in maintaining the uniform quality of your finished paper.

Railway Supply has direct, dependable connections with a great number of Cotton Seed Oil Mills. Through these valuable connections, we are assured adequate linters of the type best suited for the manufacture of fine paper, at all times. We will be glad to give quotations on your requirements.

The RAILWAY SUPPLY & Mfg. Co., AND AFFILIATES

Specialists in Grading, Marketing and Processing Cotton Fibers

General Offices: Cincinnati, Ohio

Plants:	Cincinnati, Ohio Franklin, Ohio Atlanta, Ga.	Charlotte, N. C. Covington, Tenn. Greensboro, N. C.	*Sales Offices:*	New York, N. Y. Chicago, Ill. Detroit, Mich.

RAYCO LINTER COTTON

Coloring Methods

for Paper's New Horizons

War's demands widened both the use of paper and the use of color in paper.

Close to these advances, National Technical Service can be of practical assistance in applying improved coloring techniques to post-war paper products. It includes:

The expert advice of practical technicians on paper-color problems and stock analyses.

A complete line of paper-maker's colors rigidly standardized to assure uniform quantity-production results.

Nearby warehouse stocks promptly serving all American and Canadian producers.

Remember—Always Call Upon National Technical Service First.

NATIONAL ANILINE DIVISION

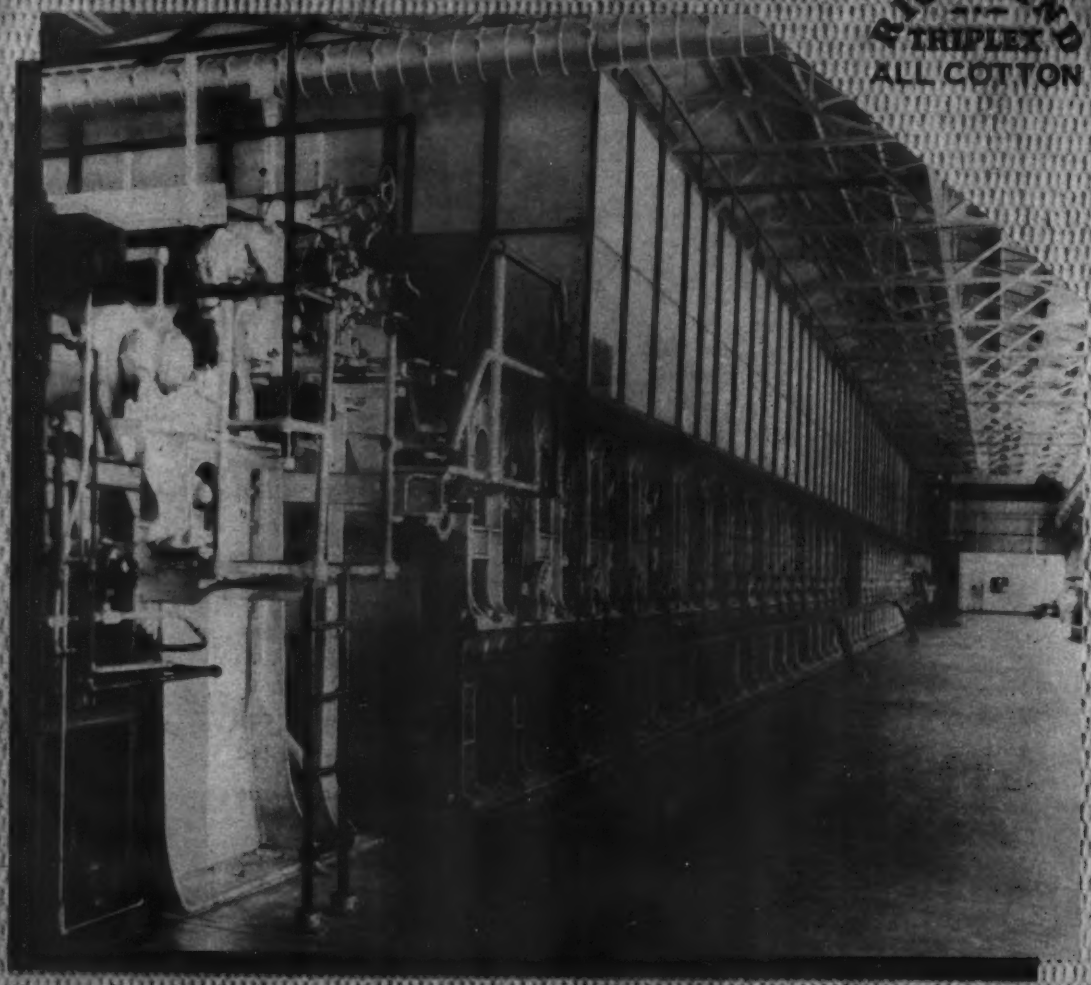
ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET NEW YORK 6, N. Y.

BOSTON PHILADELPHIA GREENSBORO CHATTANOOGA
PROVIDENCE SAN FRANCISCO ATLANTA PORTLAND, ORE.
CHICAGO CHARLOTTE NEW ORLEANS TORONTO

ASSOCIATED WITH UNIFORM QUALITY FOR OVER HALF A CENTURY

RICHLAND
TRIPLEX
ALL COTTON



Low in Stretch and Shrinkage, these Dryer Felts Stretch Profits, Shrink Costs

Longer life, a minimum amount of stretch and shrinkage, and high porosity with lower steam consumption are the factors that have given RICHLAND Triplex all-cotton dryer felts their pre-eminent position in the paper industry. Made from choice grades of cotton and woven to a high degree of uniformity, they have highly uniform, long wearing contact surfaces that help produce fine qualities of paper. For efficiency and economy, specify RICHLAND Triplex all-cotton felts.

MT. VERNON WOODBERRY MILLS, INC.

TURNER HALSEY COMPANY
Selling Agents
40 WORTH STREET * NEW YORK, N. Y.
CHICAGO · NEW ORLEANS · ATLANTA · BALTIMORE · BOSTON · LOS ANGELES · SAN FRANCISCO

THE BROUGHTON S–10–XM OSCILLATING SHOWER WILL SAVE WATER ON YOUR CYLINDER MOULDS THICKENERS WIRES and VATS

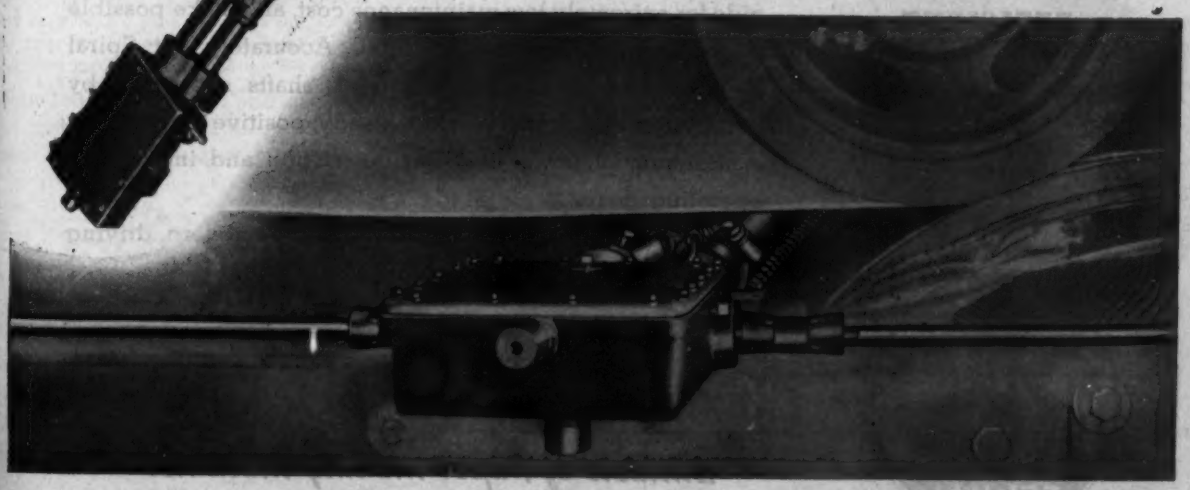
This mechanically oscillated shower requires less than 6 gallons per minute of fresh filtered water to do a thorough job of continuous cleaning of wire face.

It can be installed on any cylinder mold and beneath the felt. It can be equipped with non-oscillating, adjustable deckle edge jets. This same shower can be applied in any position where a shower is necessary and will clean felts and Fourdrinier wires.

Although our facilities are presently engaged in war production we will endeavor to meet your requirements as occasion permits.

We are also the manufacturers of 5-13-XM Showers for cylindrical screens and head box needs.

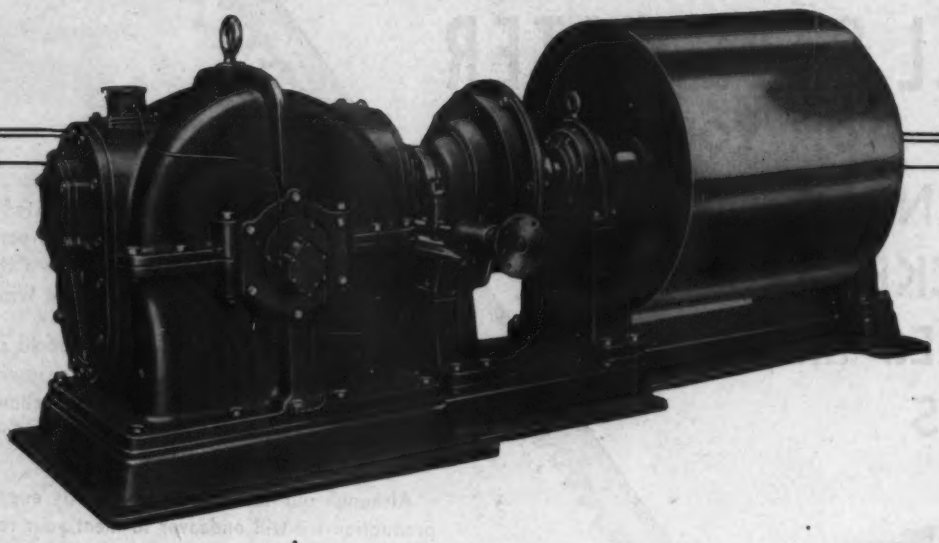
Information and Drawings upon request.
Pat. November 3, 1942—2300909
(Other Patents Applied For.)



A. E. BROUGHTON & COMPANY
GLENS FALLS, N. Y.

Bagley and Sewall

HYPOID GEAR DRIVES



★

★

ECONOMICAL

EFFICIENT

DEPENDABLE

★

★

MODERN types of enclosed, all-metal driving units have become so universally accepted by progressive mills that serious consideration should be given to replacement of old type drives.

The design and construction of these modern units provide for extremely low maintenance cost, and make possible a steadier running paper machine. Accurately cut Spiral Bevel or Hypoid gears, mounted on shafts supported by anti-friction bearings, deliver a steady, positive power with a minimum of power loss due to friction and improperly operating gears.

Detailed information regarding these modern driving units is available upon request.

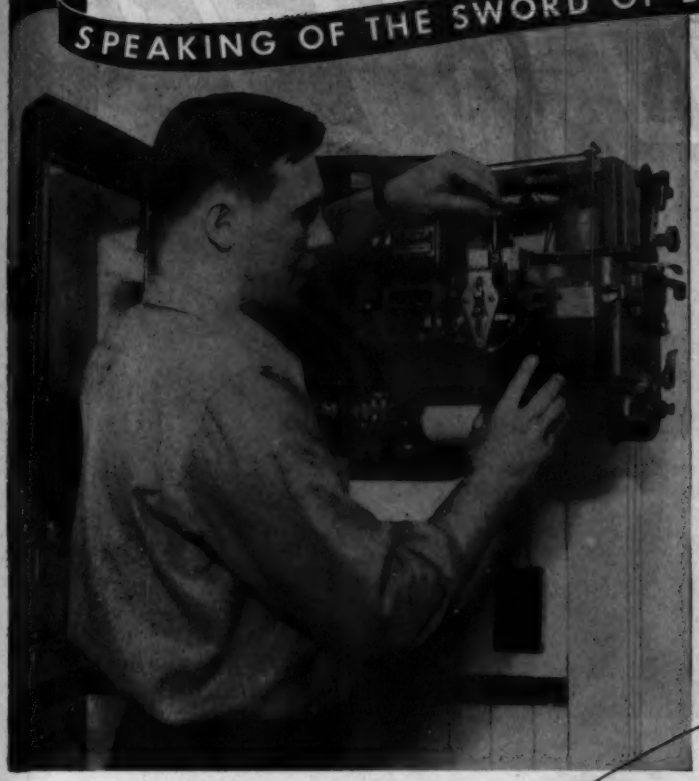
BAGLEY B&S SEWALL

THE BAGLEY & SEWALL COMPANY

Builders of Paper Making Machines

WATERTOWN, NEW YORK

SPEAKING OF THE SWORD OF DAMOCLES . . .



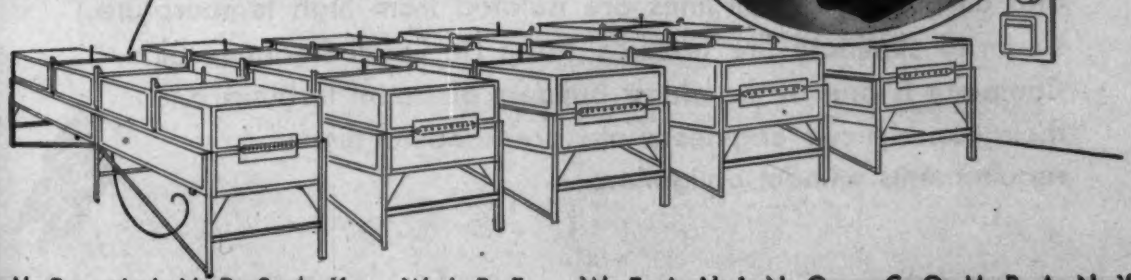
. . . MANY IMPORTANT MATTERS NOWADAYS DEPEND, TOO, UPON A MERE *Thread*

This Galvanometer is a "Fever Thermometer"

Annealing furnaces at Lindsay must not develop either fever or chills. Although the temperatures are high, ranging from 1200 to 1400 degrees, a variation of more than five degrees cannot be tolerated. If that were to occur, the quality of our Fourdrinier wires would be threatened.

The heat in each furnace sets up a current in the thermocouple. The current is transmitted to the galvanometer seen at the right. The moment the temperature rises too much or drops too much, a needle on the left side of the instrument is deflected. That slight movement automatically raises or lowers the temperature. And our sensitive "fever thermometer" is suspended between two strands of very delicate wire — *a mere thread.*

Yes, "little things" can and do make a big difference. It is in the spirit of thus attending to minute detail that Lindsay has been weaving wire cloth for upwards of 40 years.



THE LINDSAY WIRE WEAVING COMPANY

Serving the Paper Industry Since 1903

14001-14299 ASPINWALL AVENUE

CLEVELAND 10, OHIO

Lindsay WIRES FOR PAPER MILLS

POWER

for Wyandotte — SECOND DE LAVAL TURBO-ALTERNATOR INSTALLED FOR MODERN MUNICIPAL STATION

Power for the City of Wyandotte, Mich., is generated in part by two DE LAVAL turbo-alternators . . . a 6000 kw. and a 4000 kw. unit; the older unit having been installed in 1940 and the newer unit in 1943. The excellent performance of the first De Laval unit influenced the purchase of the second. • Both units are so arranged that oil pumps and oil lines are isolated from high temperature steam to eliminate fire hazards. • The De Laval Steam Turbine Company is one of the oldest builders of steam turbines and their experienced engineers are prepared to discuss your requirements without obligation.

3329

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STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

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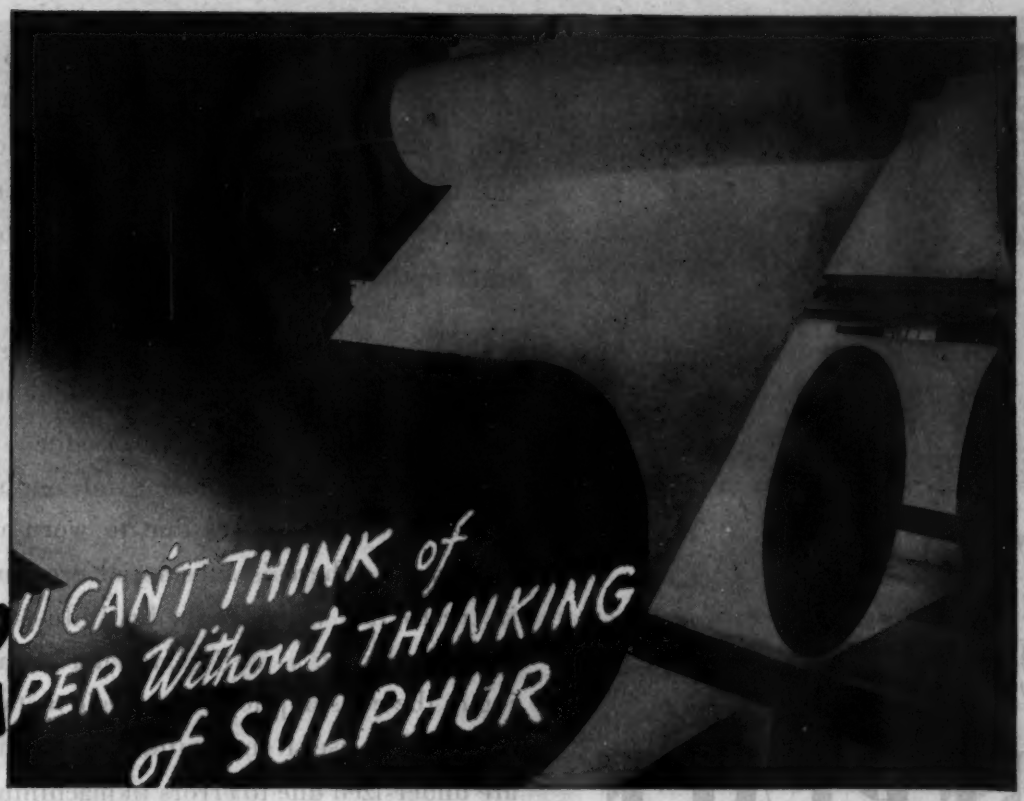

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EXPLOSIVES	PETROLEUM PRODUCTS
FABRICS	PLASTICS
FERTILIZERS	PROCESSED FOODS
FILM	REFINED METALS
FOOD PRESERVATIVES	REFRIGERANTS
FUMIGANTS	RESINS
FUNGICIDES	RUBBER
GASOLINE	SYNTHETIC RUBBER
GLASS	SOAP
GLUE	SODA
GLYCERIN	SOLVENTS
INSECTICIDES	STEEL
KEROSENE	SUGAR
LEATHER	TEXTILES

On both home front and battle front, paper is working for victory in countless ways. The wrappings protecting bottles of precious blood plasma... cartons containing vital supplies ... newspapers telling the story to the folks at home... all these vital needs are made possible by that commonplace necessity, ... paper, which in turn is vitally dependent upon Sulphur for its production.

Sulphur Dioxide is the active agent used in the sulphite paper industry to solubilize the undesirable constituents in the pulpwood effecting their removal from the cellulose... Salt cake, a by product from the reaction of Sulphuric Acid and salt, and synthetic salt cake, made from Sulphur and soda ash, are used in the kraft paper industry. Finally, compounds of Sulphur are used in the pigments and finishing agents to impart desirable characteristics to high-grade paper.

The Freeport Sulphur Company has on hand an ample supply to fill the anticipated needs of this and other important industries. This supply, plus large underground reserves and efficient mining methods, assures uninterrupted flow of this essential mineral.

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The Chrome Plate

FULL-TIME emergency operations shorten the normal useful life of machinery and equipment. Necessary replacements are frequently unavailable, but essential production MUST continue without interruption.

Industrial CRODON-plating provides new-equipment performance. It avoids the use of scarce metals for *entire* machines or parts. It shortens replacement time and reduces production losses due to worn-out equipment. There is substantial economy in restoring worn parts by industrial chrome plating, as well as a material saving in the consumption of strategic metals. CRODON is useful in rebuilding parts that are undersized due to errors in machining.

CRODON plate re-surfaces worn parts with an extremely hard, smooth, long-wearing, corrosion-resistant protective coating. It may be finished to exact tolerances. It is available to essential industries as a proven method of repair and maintenance—more than ever useful on new equipment for dependable operation. Behind every CRODON application are the resources, experience and reputation of America's oldest and largest industrial chromium plating organization.

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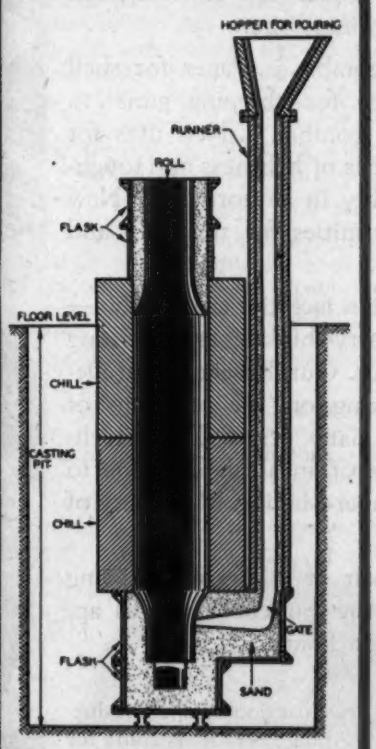
THERE'S MORE TO A FARREL ROLL

than what meets the paper



The body of a calender roll is formed by pouring molten metal into an iron mold or chill. Iron being a good conductor of heat, cooling is rapid, causing the surface of the roll body to "chill" and harden. The body of the roll below the chilled surface cools slowly, forming a gray iron structure which gives strength to the roll. Sand molds are used for the necks, and, since sand is a poor conductor of heat, the metal becomes a gray iron composition with physical properties which make the necks strong, yet readily machinable.

Beneath the mirror-like surface of a Farrel calender roll lies evidence of how the experience and facilities of Farrel combine in making a roll that gives maximum paper-making service.

The white iron skin or chilled surface of the roll varies in depth from ⅜ inch in small sizes to 2 inches in large diameter rolls. While this chill provides an extremely hard surface capable of taking a very smooth finish, it is relatively brittle. The strength of the roll lies principally in the gray iron structure of the roll body. In every Farrel roll the thickness of chilled surface, intermediate mixed iron and gray iron body are combined in correct proportion to provide maximum service without danger of breakage.

To produce a clear chill of correct depth on rolls from 5" to 72" in diameter and up to 312" in face length, requires specialized experience and facilities—the kind of experience and facilities that Farrel has developed over nearly a century of casting, machining and grinding many thousands of different sizes and types of rolls.

Deep pits for vertical casting . . . iron chills in a complete range of sizes . . . pouring and handling equipment . . . special tools for machining . . . Farrel swing-rest grinders with the patented automatic crowning device . . . Farrel roll calipers—these are part of the facilities, operated by men of long experience in every phase of roll making, that you will find in *America's largest specialty roll shop.*

Write for information about rolls for specific applications or for details of any of the other products listed on this page.

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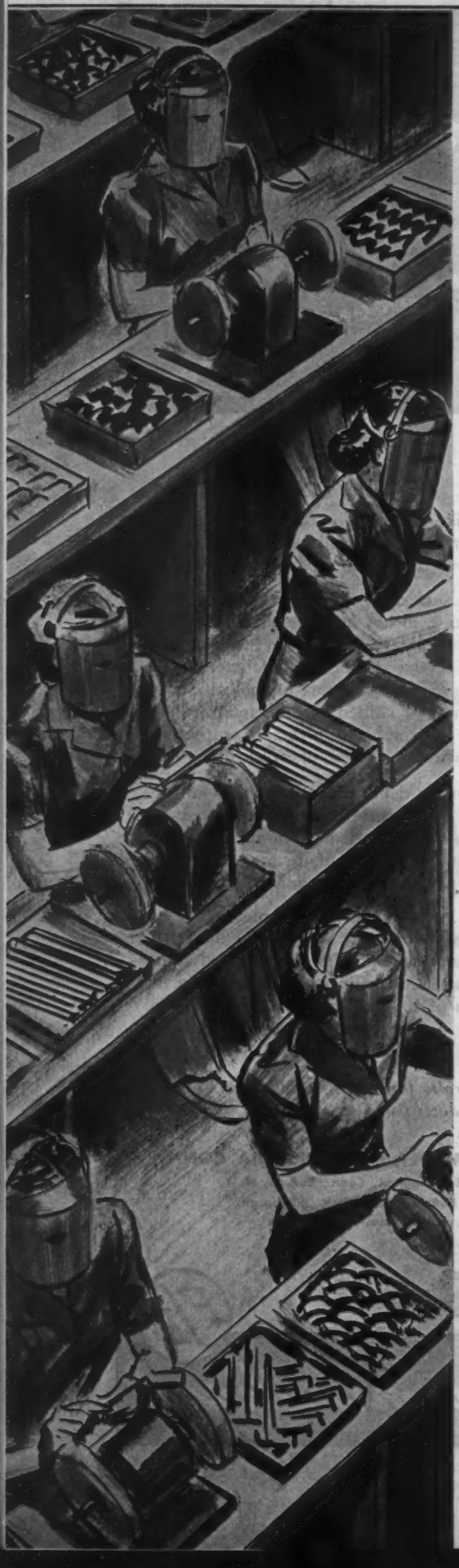


PAPER DUST MASKS

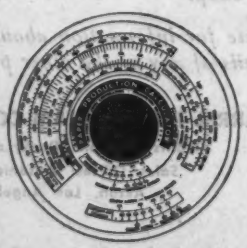
(NEWS ITEM: *Face masks to protect war workers from dust are being made of paper.*)

Paper that can be stitched and washed and ironed like a fabric is now being used to make caps and face masks to protect war workers from dust. Tiny pores in the paper permit the air to move through it freely, but strain out dust particles of ordinary size.

Paper for making practice bombs . . . Paper for shell case coverings . . . Paper bags for shipping guns . . . Paperboard rings for rolling bombs . . . New uses for paper, calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

Puseyjones men and production facilities are at War—and Industry at War is Industry thinking and working at hitherto unheard of speeds. Our Research and Development Committee, working on the problems of America at War, is finding many practical and technical advantages that will be of incalculable value to America at peace—to the Paper-Making Machinery of the future.

We are in a position to repair or modernize existing machines where essential to the war effort and as approved by the War Production Board.



The new Puseyjones Paper Production CALCULATOR is yours for the asking. A time saver for superintendents, engineers, executives or other interested members of your organization.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF SUPERIOR QUALITY

Vol. 120, No. 25

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

June 21, 1945

American Pulp and Paper Superintendents Plan New Association Activities

Heartened by an examination of the progress that it has made in the past year, the American Pulp and Paper Mill Superintendents Association, Inc. closed its annual meeting on June 9, in New York City, with a definitely formulated plan for a series of activities that will benefit the whole industry which its membership serves. The meeting just closed in deference to wartime travel conditions, was of a skeleton nature, with only a few more than a quorum present. It followed a meeting of the board of trustees that was held on the previous day. But on the score of results, as these will be unfolded during the years ahead, it is safe to assert that the actions of this meeting will place it among the most significant that the Association ever has held.

Barton Again Is President

Two days packed full of routine business closed with Raymond L. Barton reelected president of the association. Four vice presidents of last year were each promoted a step in their rank, after Niles M. Anderson, first vice president, found it impossible to continue his services to the association because of the pressure of his business upon his time. Homer H. Latimer, of the Champion Paper and Fibre Company is the new first vice president; Raymond F. Bennett, of the Ecusta Paper Corporation, is now second vice president; Olie W. Messner, of the Robertson Paper Box Company, is now third vice president and Charles H. Reese, of the Nekoosa-Edwards Paper Company, moves up a step to become fourth vice president. Newly elected to vice-presidential status is James Fish, of the Paterson Parchment Paper Company, as fifth vice president. Killey E. Terry, whose term has expired was again elected to the finance committee. Fred C. Boyce and William H. Brydges are the others of that committee. George W. Craigie was again elected secretary-treasurer.

Organization Is Prosperous

Removal of the association office to New York has been found most satisfactory in the results that have followed it. The association now finds that it can keep in closer touch with its membership, its affiliates, and with associations that serve other interests of the industry. This has made for more effective operation all along the line, and has resulted in action taken at the recent convention to transfer all of the association interests to New York. By action of a quorum of stockholders present the assets of the Ohio corporation which heretofore has served as the skeleton of the association were transferred to a new similar corporation chartered in New York State last December for the purpose of serving the same function. The Ohio corporation, for which no further usefulness exists, will be dissolved.

In the transfer of the company from one state to another, it was reported by the treasurer that the association is in a flourishing condition financially. The membership has passed the thousand mark.

RAYMOND L. BARTON
President, American Pulp and Paper Mill Superintendents Association

HOMER H. LATIMER
1st Vice President, American Pulp and Paper Mill Superintendents Association

To Continue Bolton Award Contest

Highly beneficial results have accrued during the year from the first annual Bolton award contest. Final selection of the winning papers on a national basis still is to be reported, but a general sense of those present at the meeting indicated a feeling that the effort had been of considerable value. A wealth of attention has been directed to improvement of employee relations, and a substantial volume of suggestion backed by practical experience has been uncovered among the papers that were submitted in the contest. Both management and the mill men have found benefits from this contest.

The superintendents have elected to cooperate in a second such nation-wide contest with John W. Bolton and Sons, Incorporated, donors of the awards. Details and specific subjects are to be worked out in conference between the committee and the Bolton company. It may be expected that more detailed announcement will be made public later in the summer, after an opportunity has been given to consider the suggestions for subjects that have come in to the committee during the past several months.

Interesting Announcements Expected

Many interesting announcements may be looked for during the next year. Plans that have been privately discussed for a long time to render the association of greater service as an exchange of information and a source of help have reached the stage where they may be translated into action. Problems of members, and of the entire industry, have been studied and programs drawn up by which the association may aid individual mills to solve problems that have become more pressing as demand for production has continued at a high war time level. This has presented a challenge to the Association, and from acceptance of this challenge has developed a plan which it is hoped, can hold some possibilities of help to those mills which will be offered the services when final details shall have been worked out.

Divisional Groups Continue Active

Though sharp curtailment of its national convention was imposed on the superintendents association, a high level of interest in the association's program has been maintained through continued activity of sectional divisions. To promote more frequent and profitable contact among members the association is grouped into ten divisional bodies, each with a loyal membership supporting the efforts of an able list of officers. In the meetings of these divisions experiences are exchanged, new thoughts presented and discussed, and new methods are examined as to their results in one or another mill represented by a member.

RAYMOND F. BENNETT
2nd Vice President, American Pulp and Paper Mill Superintendents Association

OLLIE W. MESSNER
3rd Vice President, American Pulp and Paper Mill Superintendents Association

Connecticut Valley Division

John H. Browne, of the Chemical Paper Manufacturing Company, Holyoke, Mass., is chairman of the Connecticut Valley Division. Cornelius Stapley of the same company is first vice chairman; Melvin J. Hathaway, of Lydall & Foulds Paper Company, Incorporated, Manchester, is second vice chairman and Henry C. Burnett of the New Haven Pulp and Board Company is third vice chairman. H. Ferguson of the American Writing Paper Corporation, Holyoke, is secretary-treasurer of the division.

Miami Valley Division

Another active division is located in that southwestern section of Ohio described generally as the Miami Valley. James J. Andrews, of the Fox Paper Company, Lockland, is chairman of the Miami Valley Division; Harold F. Bennett, of the Gardner-Richardson Company in the same Cincinnati suburb, is first vice chairman; Herbert A. Brawn, of the Miamisburg Paper Company, Miamisburg, is second vice chairman, and Joseph W. Hollmann, of the Fox Paper Company, is secretary-treasurer.

Michigan Division

Michigan contains another active division of the superintendens association. Joseph L. Waber of the Rex Paper Company, Kalamazoo, is chairman of this division. Ralph Atkins of the Lee Paper Company, Vicksburg, is first vice chairman; Walter F. Wolfe of the Mac Sim Bar Paper Company, Otsego, is second vice chairman; and Herbert B. Johnston, of Allied Paper Mills, Kalamazoo, is secretary- treasurer.

New York-Canadian Division

H. D. Cook of Sweet Brothers Paper Manufactur-

SUPERINTENDENTS NUMBER

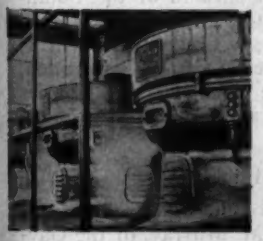
These Bird Machines As the Means of Making Better Paper and More of It at Lower Cost

1. THE BIRD SCREEN

It is handling the bulk of all grades of paper made on this Continent. It is essential for continuous production of uniformly good paper at high speed.

2. THE JONSSON SCREEN

It is proving the ideal *knotter* for all grades of pulp, *coarse screen* on groundwood, soda, sulfite and sulfate, *fine screen* on chemical pulps, bleached or unbleached, and *tailings screen*.



3. THE BIRD CENTRIFINER

It is producing cleanest paper in the fine grades and specialties by triple centrifugal treatment. It assures thorough removal of heavy dirt, light dirt, rubber particles and other foreign matter.

4. THE BIRD DIRTEC

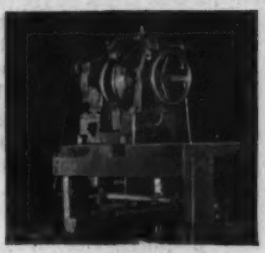
It is separating dirt from paper stock with remarkable effectiveness by pressure drop—no moving parts. Continuous in operation. Easy to install. Economical to operate and maintain.

5. THE BIRD SAVE-ALL

It is keeping precious papermaking fibres from going to waste with paper machine water. It returns stock and water for immediate re-use at lowest net cost.

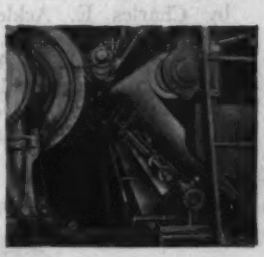
6. THE BIRD CONSISTENCY REGULATOR

It holds stock consistency to within plus or minus 0.1%; operating on stock from less than 1% to 12% consistency. It is instantaneous in action, recommended wherever accurate, dependable control is needed.



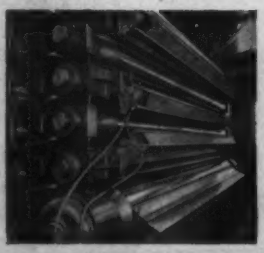
7. THE VICKERY FELT CONDITIONER

It keeps press felts continuously clean and open without mid-week shutdowns, improves paper finish and assures maximum water removal at the presses.



8. THE VICKERY DOCTOR

It keeps papermaking roll surfaces always in shape to do their best work. It is essential for continuously efficient operation of press rolls, wire rolls, breast rolls, dryers, calenders and super-calenders.



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BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

ing Company, Incorporated, Phoenix, N. Y., is chairman of the New York-Canadian Division. C. Ives Gehring, of the Oswego Falls Corporation, Oswego, is first vice chairman; Jean Paul Rolland of the Rolland Paper Company, Limited, St. Jerome, Quebec, is second vice chairman; John D. Kane of the Flower City Tissue Mills Company, Rochester, is third vice president, and William Colitre, Dilts Machine Works, Fulton, is secretary-treasurer.

Northeastern Division

The Northeastern Division includes in its membership the superintendents of mills throughout New England, with the exception of those belonging to the Connecticut Valley Division. Its chairman is George Bidwell, of the Adams Paper Company, Inc., Wells River, Vt. Charles L. Ferguson, first vice president, is with the Oxford Paper Company, Rumford, Me.; second vice president is George E. Fuller of the St. Croix Paper Company, Woodland, Me.; third vice president is Frank W. Roberts, of S. D. Warren Company, Cumberland Mills, Me. and secretary-treasurer is Mariam L. Stewart of Lincoln, N. H.

Northwestern Division

Roy I. Nilsen, of the Northwest Paper Company, Cloquet, Minn., is chairman of the Northwestern Division. Lester J. Smith, of the Combined Locks Paper Company, Combined Locks, Wis., is first vice president; R. A. Nugent, of the Nekoosa-Edwards Paper Company, Incorporated, Fort Edward, Wis., is second vice chairman. C. W. Jensen of the Northwest Paper Company is secretary-treasurer.

Pacific Coast Division

S. A. Salmonson of the Soundview Pulp Company, Everett, Wash., is chairman of the Pacific Coast Division. He is aided in his leadership of this group by Charles E. Ackley of the Crown Zellerbach Corporation, Lebanon, Ore., as first vice chairman, and by Gerald F. Alcorn, of the Weyerhaeuser Timber Company pulp division, Everett. Fred J. Armbruster, of the Dow Chemical Company, Great Western Division, Seattle, is secretary-treasurer.

Pennsylvania-New Jersey-Delaware Division

Eighth in the Association's listing of its divisions is the group of members in the area that takes in New Jersey, parts of eastern Pennsylvania and Delaware. Arthur W. Redlin of the Beach and Arthur Paper Company is chairman of this division. Jesse F. Good, of the Hinde and Dauch Paper Company, Gloucester City, N. J. is first vice chairman; Howard H. Street of the National Vulcanized Fibre Company, Yorklyn, Del., is second vice chairman, and James Traill, Jr., W. C. Hamilton and Sons, Incorporated, is third vice chairman. Mrs. Alice R. Dow, Nutley, N. J., is secretary-treasurer.

CHARLES H. REESE
4th Vice President, American Pulp and Paper Mill Superintendents Association

GEORGE W. CRAIGIE
Secretary-Treasurer, American Pulp and Paper Mill Superintendents Association

Southeastern Division

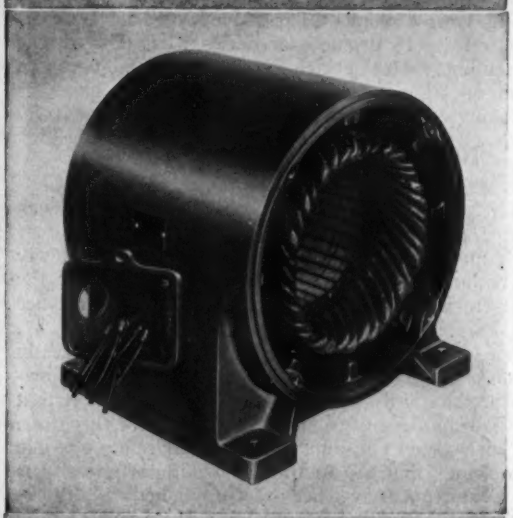
James E. Hall of the Champion Paper and Fibre Company, Canton, N. C. is chairman of the Southeastern Division. Leonard Growdon of the Mead Corporation, Lynchburg, Va., is first vice chairman; A. N. Schultz of the Chesapeake-Camp Corporation, Franklin, Va., is second vice chairman, and Charles R. P. Cash, Champion Pulp and Fibre, is secretary-treasurer.

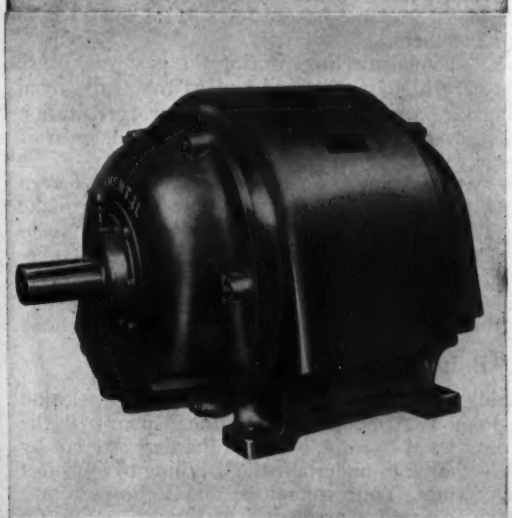
Southern Division

The Southern Division completes the roster of sectional organizations. John M. Murray, of the Gaylord Container Corporation, Bogalusa, La., is chairman of this group. Norman U. Dickinson of the National Container Corporation, Jacksonville, is first vice chairman; E. A. Newman of the Crossett Paper Mills, Crossett, Ark., is second vice chairman, and D. M. Wadsworth, of Gaylord Container, is secretary-treasurer.

MacLaren Companies Elect A. Roy

MONTREAL, Que., June 18, 1945—Following meetings of directors of MacLaren-Quebec Power Company and of MacLaren Power and Paper Company, held here, the appointment was announced of A. Roy MacLaren as president of the former company and as vice-president of the latter. In these two offices Mr. MacLaren succeeds F. T. Kenny. The late Albert MacLaren, who was well known as one of Canada's leading business men, was a former president of these two companies, and father of A. Roy MacLaren.





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your assurance of DEPENDABILITY in electric motors

MANY Paper Mills use Continental Electric motors because long experience tells them that Continental means an inbuilt ruggedness not found in ordinary motors. Here are a few of many reasons why Continental's live long efficient lives—

- Windings protected against the destructive effects of moisture, oil, weak acids, alkalies and dirt. Motor is corrosion resistant throughout.
- Dynamically balanced rotors, accurately ground, designed for smooth starting and quiet operation.
- Sturdy frames with a continuous rabbet joining bracket and frame assuring bearing alignment and a constantly uniform air gap.

Make your next motor a Continental. Write to Continental Electric Company, Inc., Newark 5, New Jersey.

CONTINENTAL MANUFACTURES A COMPLETE LINE OF A.C. AND D.C. MOTORS AND GENERATORS TO 600 Hp.

CONTINENTAL ELECTRIC MOTORS AND GENERATORS

Confidence Is Stressed to Superintendents As Pulp and Paper Industry Keynote

Their achievements during the pressure of war years, and the substantial value of these achievements to the prosecution of the war were held out to pulp and paper superintendents as one of the strongest reasons for belief in their ability to cope with problems of the future, by President Raymond L. Barton, in his annual address to these men of the industry. Talking to a limited meeting which this year substituted for the annual convention of the American Pulp and Paper Mill Superintendents Association, Inc., President Barton reviewed briefly the history of the Association's year. He paid a high tribute to Secretary-treasurer George W. Craigie, he touched on the advantages that have followed removal of the office to New York city, and he commended the results of the prize award contest in which the Association has taken an active part. All this, plus the cordial cooperation that he acknowledged from the membership, adds up to a reason for laying special stress on the word that forms the foundation of the association's emblem. That word is confidence, and Mr. Raymond believes that it should be regarded as having special significance for the membership. In his extended remarks, the president said:

President's Message for 1945

At this time I wish to call to order the 1945 business meeting of our Association. This is the first year since the founding of our Association twenty-six years ago that an annual Convention has not been held. I feel quite sure that all of you were fully in accord with the decision reached last March that, due to conditions confronting us, no other course was logical but to cancel all plans for a 1945 Convention. However, it was decided that it was necessary to hold a business meeting this year such as is being held here today due to some changes in Association affairs which had been inaugurated sometime previous to the present day critical conditions, as well as to be absolutely certain to keep ourselves legal in a strict sense of the word.

FRED C. BOYCE
Finance Committee, American Pulp and Paper Mill Superintendents Association

May I take this opportunity to pay tribute to the entire pulp and paper industry, of which all our members and industrial affiliate members play such a prominent part, for the great part that it has played in helping to bring the great European conflict to what we now feel is such a successful close. We all know that our industry, and everyone in it, will still continue to carry on with all its efforts in the same manner until the War in the Pacific is also brought to a successful ending.

During the past year, which has been rather an unusual one in several ways in the life of our Association, your President has placed special emphasis in his efforts to promote activities that will provide and render greater service to our members. There can be no question but this must be one of the ever-increasing functions of our officers and committees.

New York Office Has Proved Wise

As was authorized to be done at the 1944 Convention we have this year established a New York office. I am happy to say that our office is one of which any Association should be very proud. I say this without any feeling of personal credit for the arrangement of and work done establishing the office was done by your secretary-treasurer, George W. Craigie. The establishing of this office has already proven a great benefit to our Association and indications are that future benefits will prove so great that I hesitate to attempt to stress upon these at this time. I do wish to tell you that it has already made possible many things that are of the utmost importance to us that could not have been accomplished otherwise, which in the end means greater service rendered to all our members.

The divisional meetings during the past year were of the very highest standard and as these divisional meetings are a most integral part of our organization it is most essential that they be continued, even if necessary to do so on a restricted basis.

The various committees have been very active even though it has not been necessary for them to make preparations for programs for our Annual Convention. Their activity and spirit of cooperation may very well be shown by the fact that they are going to provide a good share of the material for the 1945 Year Book which will be published this year as usual.

Bolton Award Won Good Response

During the past year our Association in cooperation with John W. Bolton & Sons Inc., sponsored the "Bolton Award Contest." This is the first attempt by our Association to undertake the handling of a project of this nature. Your committee and Bolton's representatives devoted a great deal of time to setting up the rules of this contest and selecting the topics on which it was to be based. They finally selected topics related to the field that is possibly of the greatest interest to us today, namely those in the field of labor. When the ten winning papers in this contest are assembled in book form, and copies of these placed in your hands, you will find that the information

Gentle Screening Action
Correct Stock Agitation

Eliminates Dirt and
Lumps from Stock

Passes Uniform
Fibres . . .
Perfectly Mixed

Easily Cleaned . . .
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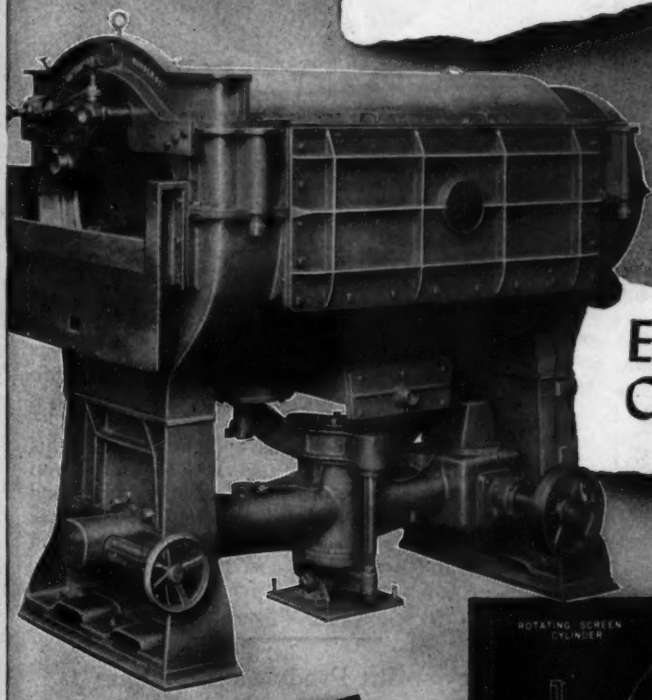

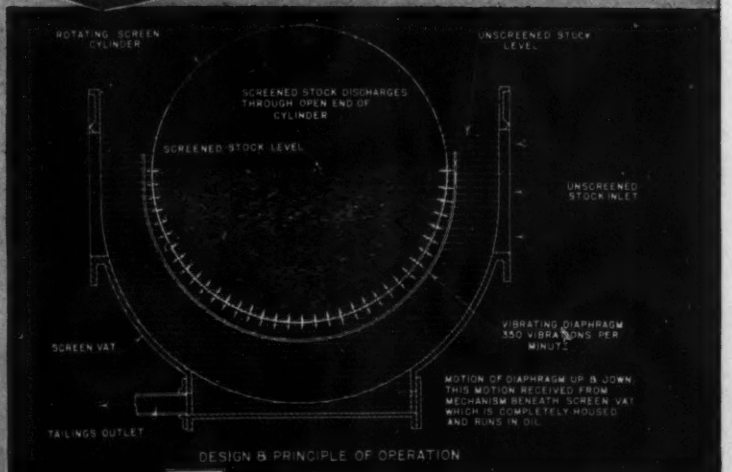
ROTATING SCREEN CYLINDER
UNSCREENED STOCK LEVEL
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MOTION OF DIAPHRAGM UP & DOWN. THIS MOTION RECEIVED FROM MECHANISM BENEATH SCREEN VAT WHICH IS COMPLETELY HOUSED AND RUNS IN OIL
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contained therein will prove of the utmost value to each and every one of us.

A year ago in Chicago committees were appointed and work started on a project to be known as the "Chemical Booklet Project." The accumulation of all the data for this booklet is now complete and about ready to be placed in the hands of the printer. When you receive your copy of this chemical booklet we feel that you are going to recognize this as one of the best jobs we have ever done and will realize the great work that can be accomplished by a committee composed of association members and industrial affiliate members working together.

Cooperation Has Produced Results

I have mentioned two specific illustrations of the spirit of cooperation that exists between our association and our industrial affiliates but I wish to dwell just a moment longer on this. I sincerely feel that there are great opportunities ahead in what may be accomplished by the carrying on of projects by our joint committees and I respectfully urge that this work be carried on with increased vigor.

When you paid me the great honor of selecting me to serve as your president I knew that the duties in connection with the office were very great. I have found them to be even greater than I expected and I could not have carried on, even as well as I have, without the support and cooperation of everyone, and I wish to express my most sincere thanks to George W. Craigie for his untiring efforts in our behalf this year.

One most important point stands out in my mind. That is that no matter what, or how much, or how little, I have contributed to the welfare of our Association while serving you as president, the benefits I have obtained in return far outshadow anything that I may have accomplished. I also fully realize that I have made mistakes, but I sincerely trust that these have been mistakes of omission rather than commission, and hope that you will not judge me too harshly for these in the years to come.

The Paper Mill News, our official organ, and all our good friends in this publication, deserve a most sincere vote of thanks for the most efficient manner in which it has brought us the news.

May I take this opportunity to thank our parent association, The American Paper & Pulp Association

WILLIAM H. BRYDGES
Finance Committee, American Pulp and Paper Mill Superintendents Association

KILLEY E. TERRY
Finance Committee, American Pulp and Paper Mill Superintendents Association

and its Secretary, Mr. E. W. Tinker, for the interest they have shown in us and our activities.

Confidence Is Justified

Also may I pay my respects to the sound judgment and ability of the founders of our association and by so doing call your attention to the word which forms the base of our emblem "Confidence." This word has always carried a large meaning but it seems that it means even more today than it ever has. So let us face the future with "Confidence," in ourselves, our association, and our industry.

With your kind permission I am going to close this message with a request. The request is that all of you continue to give all future presidents the same good counsel, assistance, and moral support that you have given me during the past year, and if you do, I am sure that our association can continue on to greater heights of achievement than it has even accomplished heretofore.

Newsprint Production Higher

Production of newsprint in Canada during May 1945 amounted to 264,464 tons and shipments to 264,767 tons according to the News Print Service Bureau. Production in the United States was 63,768 tons and shipments were 63,498 tons. The output in Newfoundland was 28,060 tons and shipments were 26,983 tons making a total North American production of 356,292 tons and shipments of 354,248 tons. Total production in May 1944 was 347,204 tons and shipments were 351,215 tons.

The Canadian mills produced 44,521 tons more in the first five months of 1945 than in the first five months of 1944, which was an increase of 3.6 percent. The output in the United States was 15,915 tons or 5.5 percent more than in the first five months of 1944; in Newfoundland production was 30,604 tons or 29.2 percent more, making a total increase of 91,040 tons, or 5.6 percent more than in the five months of 1944.

Stocks of news print paper at the end of May were 89,653 tons at Canadian mills, 6,403 tons at United States mills, and 67,715 tons at Newfoundland mills, making a combined total of 163,771 tons compared with 161,727 tons on April 30, 1945, and 160,836 tons at the end of May 1944.

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Greater Use of Poplar Is Discussed by Northwest Superintendents

The possibility of "Greater Use of Poplar" in pulp manufacture provided the theme for a highly interesting evening of the Northwestern Division of the American Pulp and Paper Mill Superintendents Association on June 1, at Appleton, Wis. An impending demand for larger use of poplar wood was set before the membership by Chairman H. P. Baldwin as originating out of certain facts about the timber. Poplar is available in large quantity for mills in the area; a survey by the United States Forest Service shows that drain has never equaled growth, and that ten times the present amount of poplar could be produced if land suitable for its growth were to be brought into production. Poplar also acts as a good nurse crop to more valuable species, and its use in this direction emphasizes the need for harvesting it at maturity so that it will not retard the growth of more desirable young trees. And because poplar is both available and low in cost, the chairman added that superintendents might as well recognize that management will increase its requests to use greater quantities of the wood.

Discussion of experience with poplar was divided into four sections according to processes in which the wood has been treated. Soda pulp was not considered at this meeting because soda mills are not represented in the section. The processes discussed were kraft, sulphite, groundwood and neutral sodium semi-chemical.

Paul West of the Thilmany Pulp and Paper Company led the discussion on experience with poplar in the kraft process. The pertinent facts brought out by Mr. West in his discussion of his company's experience with poplar covered the increased use of poplar from practically zero to 10,000 cords annually. Thilmany has found that they can use either rough or peeled poplar with the purchases averaging from five to six inches in diameter. Mr. West stated that barking the wood was not a problem for his company as they find that with very little more chemicals they can cook the wood with the bark on. Poplar has been found to be a big help to them, in that when their chip inventory is low they can push poplar through their woodroom at a high rate to keep their digesters up to schedule. With a higher percentage of jack pine coming in in the rough this has been a very important factor to them. Chipping is normal.

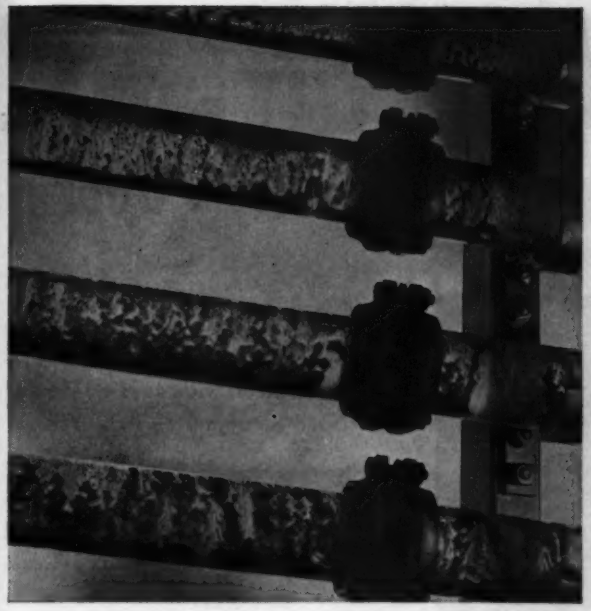
As for cooking while they have cooked some poplar straight, most of it is cooked mixed—up to 25% in any one digester. Of interest is the fact that apparently there is less dirt in the rough wood than the peeled. They cook poplar about the same as jack pine with a pressure of 110 pounds for 1¾ hours in a rotary digester. The poplar pulp resulting from this process is slightly softer; the yield per digester is slightly greater, due to more chips being put in the digester; and while they have had no check due to a slush system they believe the yield per cord of wood is greater. They base their opinion on the Forest Products Laboratory figures that show poplar contains 65% cellulose while jack pine contains 59%. The resultant pulp after a standard beating time has the following comparative freenesses of poplar with jack pine: freeness, 500 as compared to 705; mullen, 120 as compared to 146; tear, 145 as compared to 185.

Thilmany has not experimented with the bleaching of poplar straight. They have bleached as high as 20% poplar. Results on the paper machine have been very pleasing. The poplar has helped to close up the sheet, working very well in both waxing and asphalt grades. Tear has been increased in these grades because the longer softwood fibers have not had to stand the refining to get the right porosity to the sheet. The poplar pulp is somewhat dirtier but this is not objectionable in the darker grades.

Another trouble with poplar pulp is that it will not

JOHN H. BROWNE
Chairman, Connecticut Valley Div., American Pulp and Paper Mill Superintendents Association

JAMES J. ANDREWS
Chairman, Miami Valley Div., American Pulp and Paper Mill Superintendents Association



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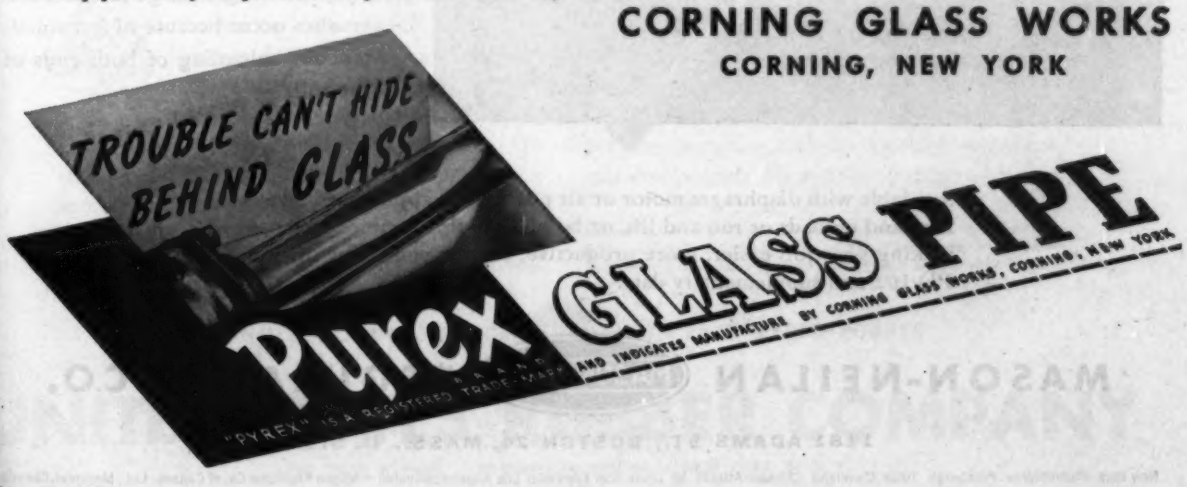
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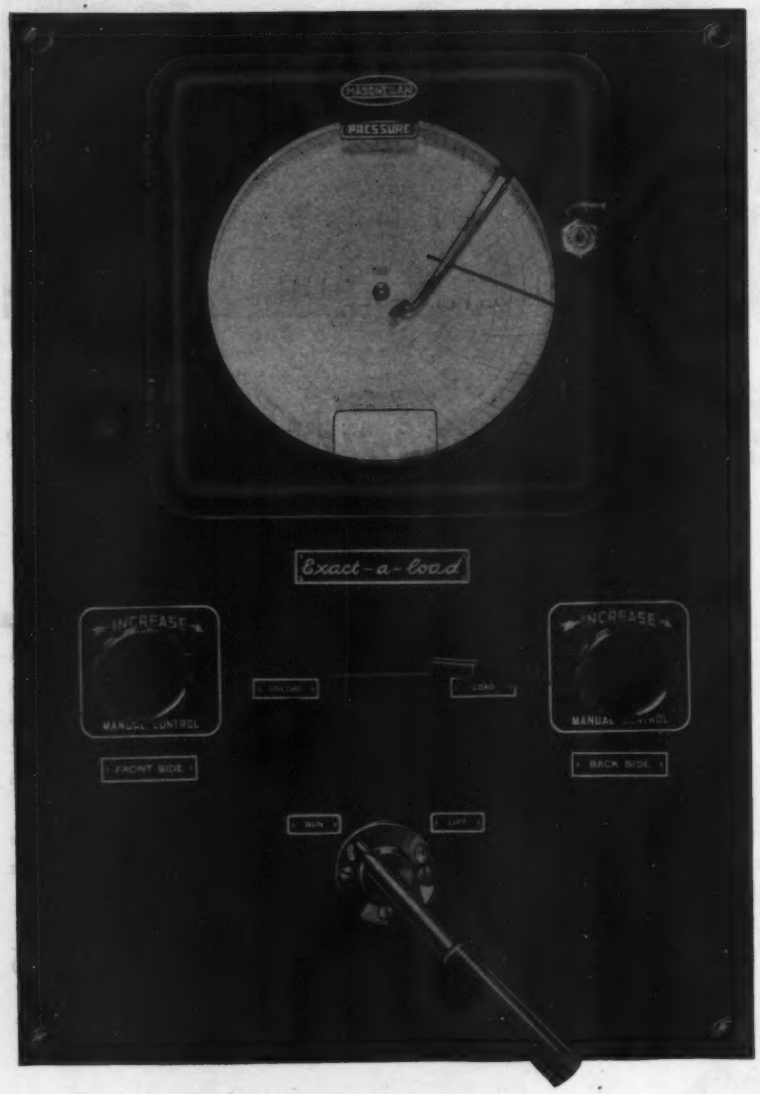

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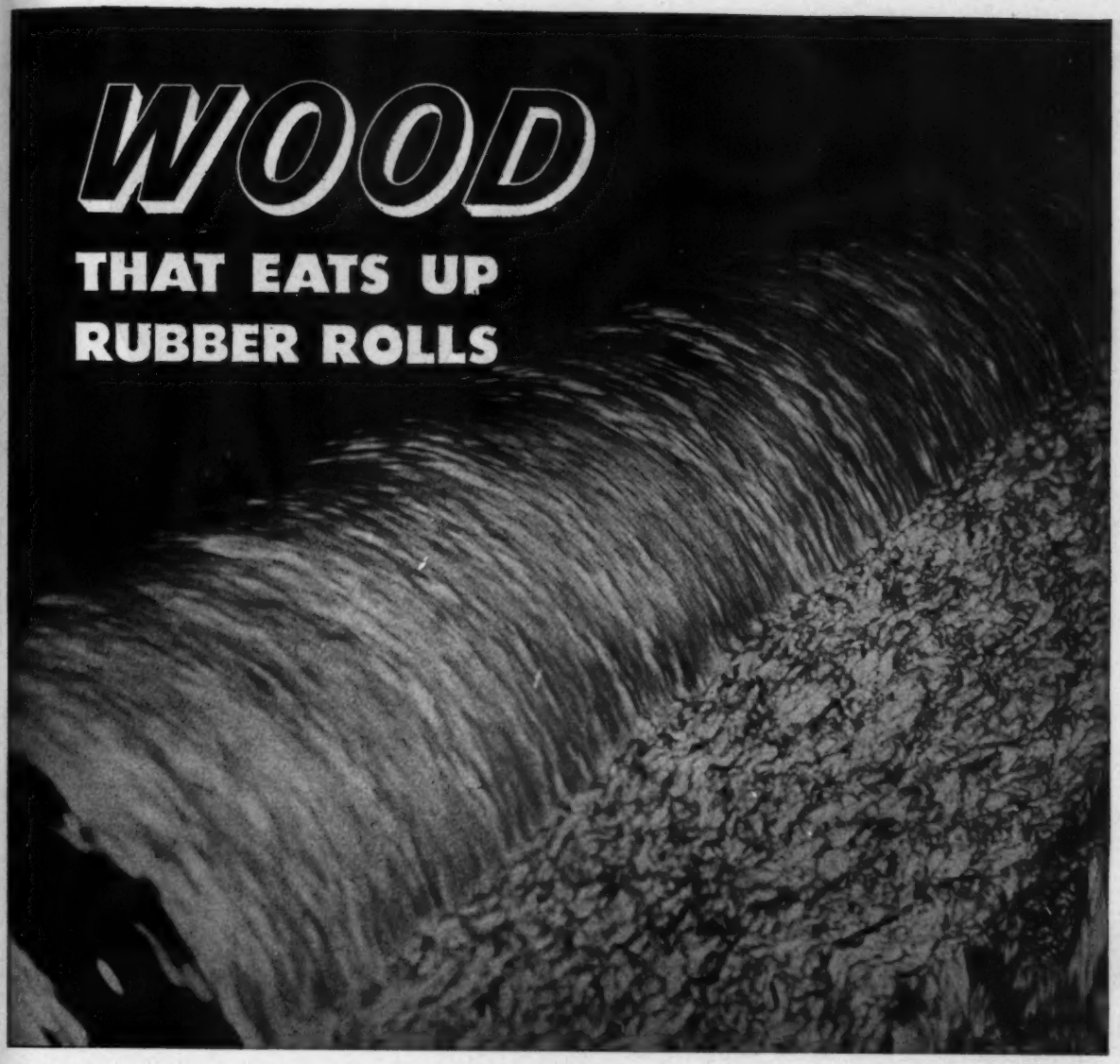

In this paper mill, it was found that the decker couch rolls were literally "eaten up" by certain materials inherent in the ground wood stock.

After several such rolls, made of natural rubber, had disintegrated, U.S. Rubber Engineers were consulted. On their recommendation, a roll fabricated of a special synthetic rubber compound was installed. This proved entirely "indigestible" to the wood stock... has already delivered many more months of service than rolls tried previously... is setting up a record for steady, trouble-free service.

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take dyes as uniformly as jack pine. West figures the economies of poplar, with the cost of poplar at $14.50 per cord and jack pine $17.50 on a basis of his estimated yield, resulted in poplar pulp being approximately $9.00 per ton cheaper. At the start of the program of using more poplar machine men were opposed to its use and had to be forced into using the pulp. When the mill recently ran out of poplar they were insistent that more be purchased immediately if they were to maintain the qualities gained by the use of poplar. These qualities were better formation and a better closed up sheet with higher tear.

In response to questions asked after the lecture questions from the audience brought out the added facts that a saving of more than ten per cent in cooking chemicals is the experience with poplar, and that no additional load is imposed on the heater room or the power plant. The question of clogging on press rolls was answered later under the head of sulphite treatment.

Leonard Parkinson, assistant paper mill superintendent and Walter Sherman, superintendent of the sulphite mill for the Flambeau Paper company jointly led the discussion on sulphite.

Mr. Parkinson pointed out that most mills in this area would not have been able to operate as full as they have if it hadn't been for poplar. He hoped that possibly in 10 or 15 years the area would become more self-sufficient in the ideal wood for papermaking but that in the meantime poplar would have to share the burden of supply.

Mr. Sherman then took over and discussed first the problem of "pitch." The best way to get rid of it, he declared, is to use seasoned wood. Flambeau has found that peeled poplar must be aged at least 2½ to 3 months. Rough wood seasons slower and must have even more time. The problem of seasoning rough wood is hard because the wood under the bark deteriorates faster than the bark itself. Small piles well aerated are a big help. Flambeau has not measured its loss in yield due to using seasoned wood but believes this is not serious. They found that barking of poplar was not hard during the stripping season. Their equipment does not allow them to cook poplar separately. It is cooked with hemlock. The

H. D. Cook
Chairman, New York-Canadian Div., American Pulp and Paper Mill Superintendents Association

speaker felt the greatest drawback to poplar was its low freeness and low strength. He wondered what improvement could be made over single stage hypochlorite bleaching.

Discussion among several members present brought out the fact that a caustic stage in bleaching poplar was very important. One per cent caustic heated to 120-125 degrees materially reduced the dirt count and also the alcohol and ether soluble components. Higher temperatures and a greater percentage of caustic would affect yield. Caustic replaces chlorine pound for pound when used as above.

Mr. Sherman wondered if various amounts of combined and free had been tried, various cooking curves, and whether rough poplar should be cooked with dry hemlock as the best combination. No one had done much experimenting with variations on combined and free. As for temperature curves some experimenting had been done but the results were not conclusive. It was felt that cooking rough poplar with dry hemlock was about as good a combination as possible. Both woods cook to about the same temperature curve.

Acid-cooked poplar is a big help towards better

Joseph L. Waber
Chairman, Michigan Div., American Pulp and Paper Mill Superintendents Association

George Bidwell
Chairman, Northeastern Div., American Pulp and Paper Mill Superintendents Association

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formation and helps printability in a book sheet, it was found. It can be used to advantage in certain manifold grades. Mr. Sherman wondered how best it could be used in a bond grade. It was felt that if poplar could be held separate special refining equipment would make it very suitable for use in bond.

Mr. Parkinson believed that pitch solvent was the best way to get gum out of wires. Care should be used to keep the solvent away from any rubber. The wire should be saturated with solvent but should be washed off before passing near the apron.

Earl Schafer, staff member United States Forest Products Laboratory, at Madison, discussed the ground wood process, on which, he said, there was not much information available. Very little work has been done in recent times though a study of variables is now in progress at the laboratory. All the work done so far has been with a single burr—10 cut 1½ inch lead spiral using a 3760-5 grade artificial stone. Some of the resulting pulps are being made into book paper and information will be available later. The problem is to study how best to produce economically suitable poplar groundwood. The main question to be discovered is whether poplar groundwood has certain advantages. Mr. Schafer made a plea that in considering poplar as a groundwood we should not consider it as a substitute for spruce but as a possible product with its own good properties. He felt more work should be done concerning the right moisture content for the best grinding, a study of the best grade of stone to be used, and the effect of wax and pitch.

Dr. William J. Foote chief chemist of Consolidated Water Power and Paper Company discussed the problems of pitch and slime that arise while running a high percentage of poplar during the summer month. He felt that the resulting problems from the use of poplar in groundwood were much greater than either in sulphite or kraft. Fundamentally the control of slime is dependent on how clean the system is kept. Since slime becomes acclimated to certain treatments perhaps the material used for control should be varied. It is recommended that as a rule a "shock" treatment (an overdose over a short period) is better than the constant small additions. He mentioned foam as another problem. Much more foam killer needs to be used if green wood is ground than with seasoned poplar. His company has found it necessary to use processed water in the groundwood mill when grinding poplar in the summertime because of slime.

S. A. Salmonson
Chairman, Pacific Coast Div., American Pulp and Paper Mill Superintendents Association

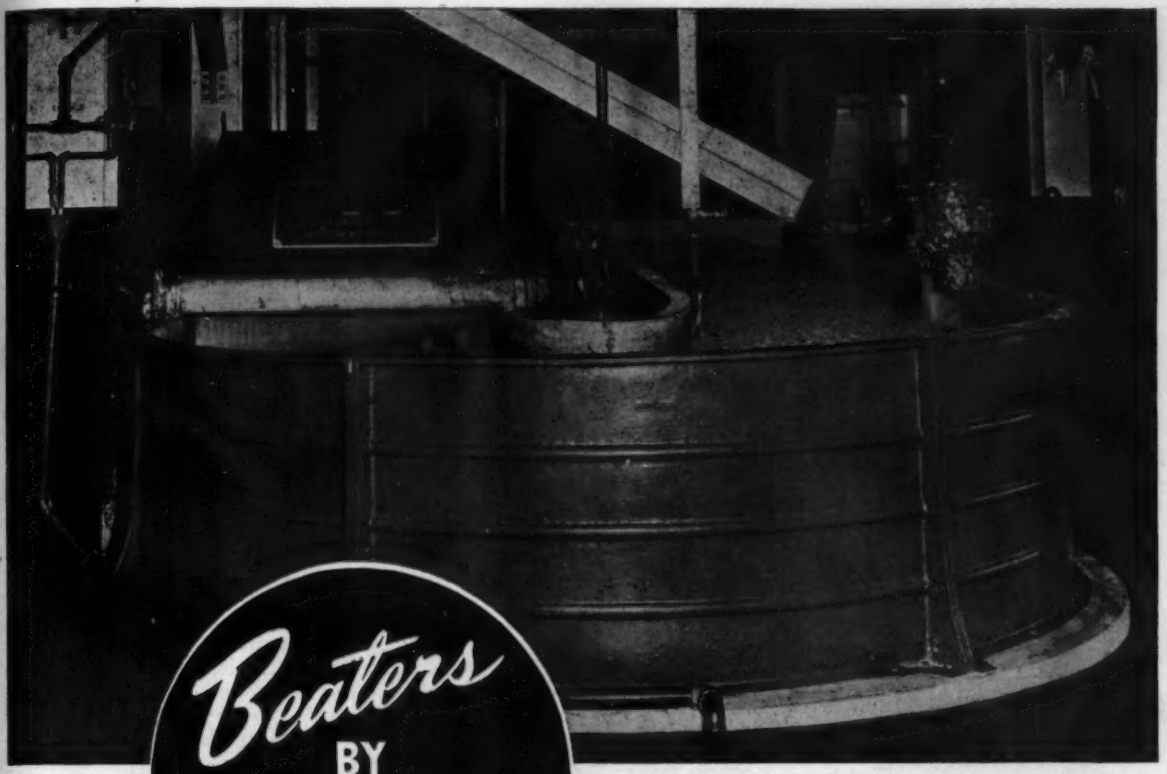
While some study has been made of what the gums are, no one has made a complete analysis to date. Several individuals felt this should be further investigated and reported on.

C. R. Morse of Wisconsin River Paper & Pulp Company wondered what experiments had been made on types of burr and patterns, and whether a stone had been especially developed for poplar. Work is being done along these lines but there is nothing to report to date. Dr. Foote felt that it was not so much the type of burr but a stone should be used with as smooth a surface as possible with higher pressure if economies in horsepower were to be gained.

Mr. Morse wondered in grinding both spruce and poplar at the same mill whether it was a good idea to start off with spruce after sharpening the stone and then towards the end of the sharpening cycle go on to poplar rather than concentrate on any single stone. It was felt this was a good plan if storage bins permitted this practice.

Roy I. Nilsen
Chairman, Northwestern Div., American Pulp and Paper Mill Superintendents Association

Arthur W. Redlin
Chairman, Pennsylvania-New Jersey-Delaware Div., American Pulp and Paper Mill Superintendents Association



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Lawrence W. Murtfeldt, pulp superintendent of Consolidated Water Power & Paper Co., outlined the advantages of poplar cooked by the neutral semi-chemical sulphite process. Poplar can be cooked by this process to give strength characteristics quite similar to those of the best sulphites. To prove this beyond the laboratory stage, with the cooperation of the Marathon Corporation a semi-commercial run was made at Rothschild for Consolidated Water Power and Paper Company. The unbleached pulp was shipped by Marathon to Consolidated for bleaching. The unbleached pulp showed a yield of about 75%. Since the resulting pulp had a high chlorine demand 12% chlorine was used in the first stage which should have been followed by a caustic second stage but trouble at the washers prohibited this. It was necessary to go direct to the last stage hypochlorite bleachers. While this resulted in lower strength and color the pulp still proved very satisfactory when run into book grades. Reports from the printer showed good printability. Murtfeldt felt the company would definitely go into this later on a permanent basis. He believed the biggest problem was that of refining semi-chemical softened chips to hold the freeness as high as possible and still get rid of shives.

John N. McGovern of United States Forest Products Laboratory's staff at Madison then stated that the Laboratory, in investigating the most effective way to use poplar, found this process to be outstanding. When poplar is treated by the neutral semi-chemical sulphite process he felt it is better than most woods due to its high cellulose content (65%). While removing the lignin this process has little effect on any of the various grades of cellulose. He added that the pulp would certainly find many uses from the standpoint of freedom from stream pollution. This pulp in this respect is very good as very few chemicals were sent to the river. No reclamation is necessary as only the amount of chemicals needed to pulp the wood are left in the digester after the impregnating stage.

Summing up the discussions Chairman Baldwin drew the conclusion that to get the most out of the use of poplar it should be considered as a special fiber, not as a substitute. Its worthwhile properties can yield greater advantages if poplar is handled separately, starting with the cooking in the digesters, through the bleach plant and even through the beater room. While poplar has been used successfully in kraft, sulphite, and groundwood as a filler pulp in going to high percentages without a loss in strength charactertistics, the neutral semi-chemical sulphite process should be considered as most promising since this process yields the strongest product. This process will bear watching, not only because of the strength characteristics of the pulp but because of the possible economies due to high yield and low wood cost. One of the difficulties of using poplar is due to the so-called "pitch." Use of seasoned wood greatly reduces this difficulty.

JOHN M. MURRAY
Chairman, Southern Div., American Pulp and Paper Mill Superintendents Association

JAMES E. HALL
Chairman, Southeastern Div., American Pulp and Paper Mill Superintendents Association

Ask Senate to Investigate Newsprint

WASHINGTON, D. C., June 18, 1945—An investigation of the shortage of newsprint is asked in a resolution introduced in the Senate by Senator Butler, Indiana, on behalf of himself and Senator Willis, of the same state.

"I have discussed this matter with other Senators on both sides of the aisle, and I am convinced a careful investigation by the Senate will not only uncover abuses in the use of paper by the Government, bungling on the part of those charged with allocating newsprint, and slow action by the agencies connected with planning to relieve the shortage in this Nation, but more important than these revelations, I believe such an investigation would work positively toward increasing the flow of newsprint to our hardpressed publishers," he said.

The resolution was referred to the Senate Agriculture Committee.

Manitoba Cuts Poplar and Jackpine

WASHINGTON, D. C., June 18, 1945—Pulpwood cut on the crown lands of Manitoba amounted to 56,380 cords in the fiscal year ended April 30, 1944, says a report received at the Department of Commerce. Of this total it is said that over 9,000 cords consisted of balsam, fir, poplar, and jackpine whereas formerly all pulpwood cut was spruce. Indications are that greater amounts of these woods will be used in the future in order to conserve the more valuable spruce.

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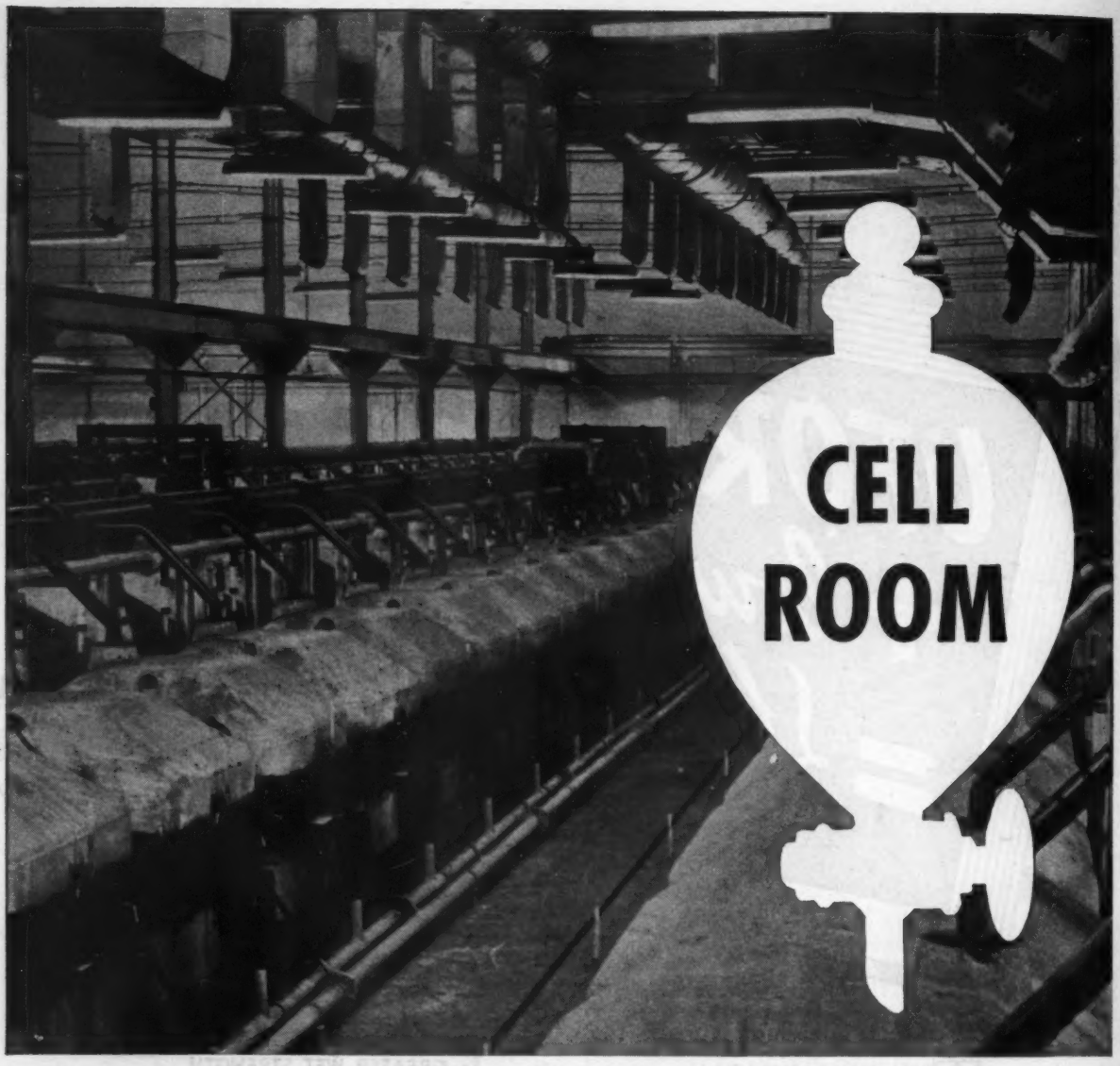

Cell room in a Chlorine plant of the Wyandotte Chemicals Corporation at Wyandotte, Michigan. Except for the hum of the enormous electric voltage, stillness reigns here. It's truly a deathly stillness—for Wyandotte Chemicals Corporation Chlorine is at present government-allocated and largely devoted to the uses of war.

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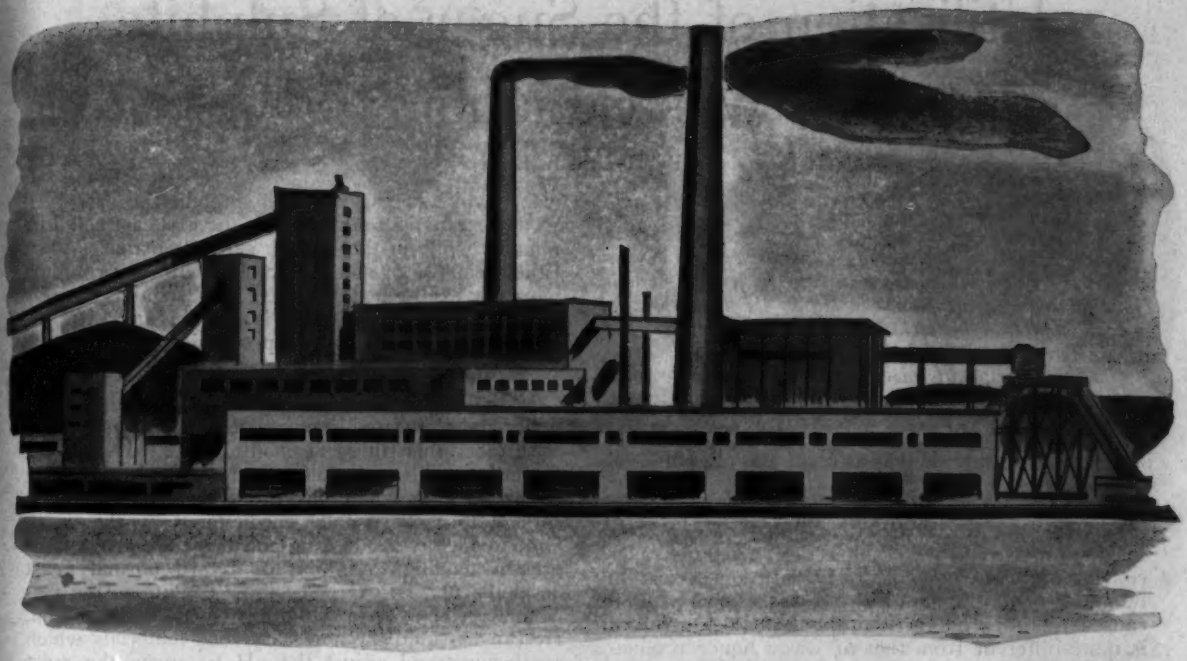

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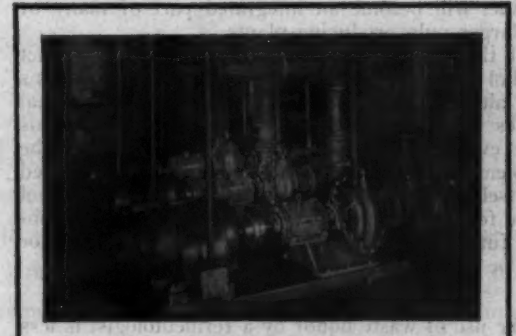

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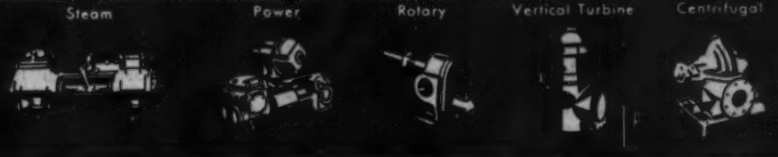

Utilization of the Sugar of Sulphite Waste Liquor*

By Donald L. Reed

Abstract

The production of alcohol from sulphite waste liquor requires a technology that differs from the processes required for other raw materials, which fact has caused, in part, the lag in its development. Yeast, molds, or bacteria may be used to convert the sugar but yeast is probably to be preferred.

The production of an edible yeast is feasible with alcohol as a byproduct.

Alcohol from sulphite waste liquor today is a fact and is here to stay. This is as certain as alcohol from byproduct molasses for the two sources are now known to be on a comparable economic basis. Why it has taken a war scarcity to initiate the present interest in recovery of saleable articles from the sugar content of waste liquor may be left to speculation by the economists, but the lag has probably been caused in part by the fact that the technology involved is quite different from that of waste liquor production. If for the past twenty years, one of the large industrial alcohol producers had been having a half million gallons of this liquor flowing across his premises every day, he certainly would not have waited until 1945 to ferment it. Once the fields of fermentation and distillation have been hurdled and the process has been brought into line with the manufacture of pulp, the production of alcohol as a byproduct will become an integrated part of many of the larger pulp producing plants.

At the present moment the subject of byproduct alcohol is somewhat confused by the many variations and alternatives proposed for obtaining additional values from the waste liquor. While these materials may eventually be obtained from this source, the problem of alcohol production should be considered by itself and the process made to stand on alcohol alone for the present. A general picture of the probable future use of the sugar content of waste liquor will be presented here.

Sugar in Waste Liquor

The use of waste liquor by a fermentologist is less novel than is the use of yeast by a producer of waste liquor. After all, the active ingredient of the liquor, sugar, is the same with small variations as that obtained from other sources. Several similarities exist between the production of sugar by sulphite cooking of wood and the production of the sugar in the wet corn milling industry.

Both are the starting point for the production of glucose, the chief sugar involved in the fermentation. Structurally the corn kernel and the wood chip have this in common: each has a discrete physical structure in which the potential sugar producing material is bound or cemented together by a second material to give the characteristics common to wood or corn. In the case of wood, lignin forms the binding material holding the cellulose fibers together while with corn, proteins cement the starch granules together. During the sulphurous acid cook lignin is removed from the wood, while during the steep proteins are removed from corn by the same acid. In the first case cellulose remains while in the second, starch remains. When either cellulose or starch is cooked with any common inorganic acid, glucose results. This sugar is entirely fermentable and the yeast is indifferent as to the sugar source or method of production.

Fermentation

If the sugar could be removed from the waste liquor and fermented in pure state no problems would arise other than those normally associated with fermentation. When the sugar is fermented within the liquor the new conditions result in an environment foreign to those usually encountered by the yeast. Growth factors are lacking and there are compounds present tending to inhibit or retard normal yeast development. To overcome these conditions the fermentologist has recourse to two methods of action. He can first add the necessary food materials which are lacking and adjust the pH to create the most favorable environment and second he can, by repeated cultivation, develop a yeast which is best suited to the resulting media. This latter field offers the greatest opportunity and certainly future development will be influenced by new types of yeast. Past fermentation history will be repeated in this respect but probably never to where the fermentologist is as jealous of his particular strain of yeast as was the old breumeister who held his yeast as his greatest treasure.

Waste liquor should not be considered as a media unfriendly toward yeast but simply as one new to yeast. In fact it has some attributes which make it superior to any wort here-to-fore used. Outstanding in this respect as compared to grain mashes is the fact that the yeast is the only suspended solid material in the beer, making its separation by centrifuging, filtration, or settling feasible. The liquor is known to have other good attributes and more should become apparent as the industry explores new techniques for handling yeast.

Yeasts, which in reality are microscopic single cell plants, are not the only microscopic organisms used in commercial fermentation and proposals have been made to use a bacteria or mold fermentation instead. Thus one may theoretically produce any of a large number of materials, ranging from butanol to penicillin simply by employing the proper organism on the liquor. If molds were employed on the large scale necessary with a 350 ton per day pulp plant, the fermentation would have to be of the submerged type which is difficult at best. Furthermore the products are usually soluble solids rendering their separation from other solids difficult. Materials produced by mold growth are expensive and in a price class having only small volume markets hence a successful fermentation would not solve the problem of liquor disposal on a large scale.

Still another type of fermentation is that of bacteria. Most notable is the production of acetone and butanol. While both of these materials have been a drug on the market at times in the past they enjoy

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a good demand at present and may continue to do so for some time. However, the fermentation process is a great deal more involved than that of yeast. The best of control laboratories is necessary and the plant equipment is much more expensive to install and operate than that required by yeast. Dealing with bacteria of this type rather than yeast is similar to growing orchids rather than dandelions. A bacterial fermentation of a hundred thousand gallons can be entirely destroyed in a few hours by phage attack, requiring a cessation of all activities until the plant can be sterilized. Such a shut-down can wipe out profits for a considerable length of time.

Production of Yeast

An attractive field has been suggested for the use of waste liquor in the production of edible yeast. That grown on sulphite waste liquor has a very mild flavor, is light in color, and almost indistinguishable from the product grown on molasses. Yeast production from waste liquor offers a means of utilization of the sugar content with the minimum of capital investment and technical difficulties.

The chief value of yeast as a food for human consumption on a large scale has been as a source of protein for providing a balanced diet. Thus the people of the West Indies Islands having an excess of molasses and high density of population with lack of means for maintaining sufficient livestock find it expedient to use yeast as a meat substitute. Through the growth of yeast they are able to produce 100 pounds of material of 50% protein content in 24 hours, whereas it requires 6 months to raise a hog having a similar amount of protein. Coupled with this is the fact that it requires about 7 pounds of grain feed to produce 1 pound of pork. Economics greatly favor yeast as a food but there is little market for it in this country other than the regular demand supplied by baker's yeast producers.

Considerable yeast is used at present as a stock and poultry feed supplement. Its chief source at present is from distiller's residues containing the yeast of their fermentations. The main value of yeast in poultry feeds is its vitamin content. For this reason, until the vitamin content is established by assay on yeast grown on the particular waste liquor obtainable, one should not evaluate the product as a source of long range profit. With the present dearth of protein rich feed stuffs, a fodder yeast would also be in good demand for its protein content, but once normal economy is established and the regular supply of feeding material is available, feed mixers may not show as great an interest in this product.

By-Product Alcohol Recovery

If a yeast fermentation for the production of industrial alcohol is carried on, it remains to recover the product from the beer. At this point the process ties in with the ancient art and well established practice of distillation. No new fundamental problems are met with differing from those common to oil refinery and distillery practice. True, new materials of construction may be necessary, a more dilute beer must be dealt with requiring additional steam and methanol must be removed to yield alcohol of high purity, but these variations are routine problems to the design engineers of equipment construction companies and can be solved by conventional methods.

In making a final choice as to the best way of utilizing the sugar of waste liquor, one eventually meets the wide difference of opinion as to future markets for ethyl alcohol. Quite properly industrial alcohol must be considered as a pure chemical, which in fact it is except for its small water content. A survey of a list of pure organic chemicals reveals the fact that 8 to 14 cents per pound is a good going price for those in large use. Exceptions are petroleum products, sugar and starch (the first and last of which are not pure compounds). When ethyl alcohol is placed in the class of pure organics in large use it should sell for 8 to 14 cents per pound or from 54 to 94 cents per gallon on a 200 proof basis; yet an attractive profit on this material is possible at 30 cents per gallon.

As to the immediate future of byproduct alcohol it is certain that a simplification of process details will take place and that as a consequence production costs will tend downward from present figures. Few new processes continue long as they are initiated but improve rapidly at first and only become stable when all possibilities of the field have been explored. One may expect new byproduct alcohol plants to differ in details as they come into being and such changes will insure the permanent existence of the new industry.

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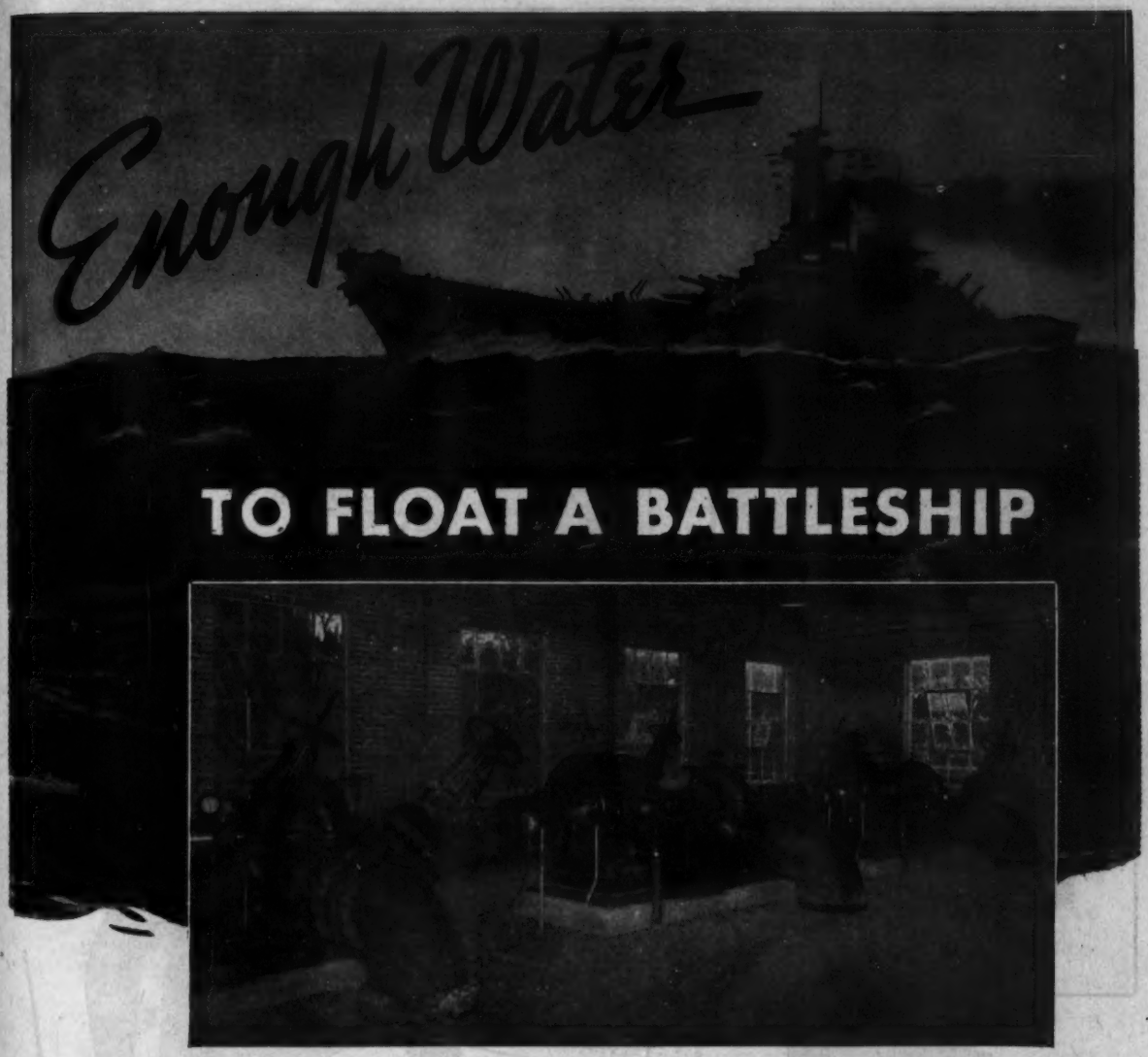

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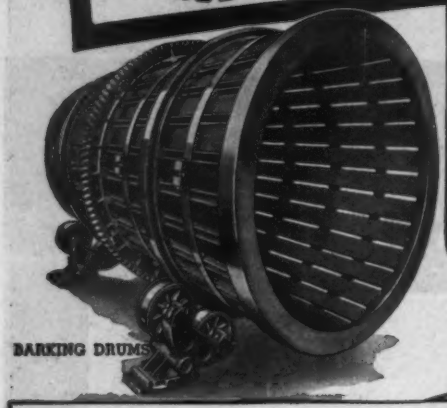

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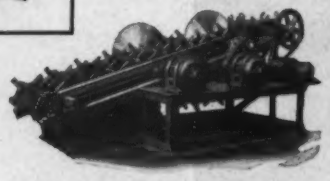

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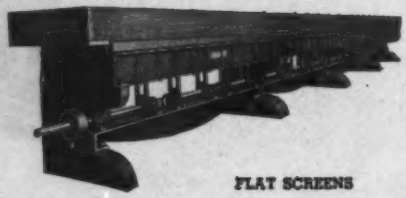

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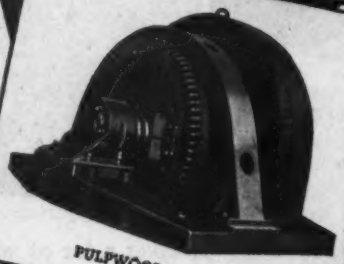

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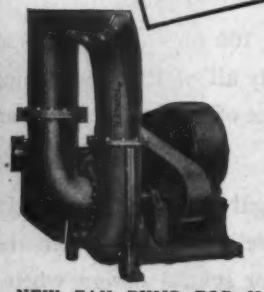

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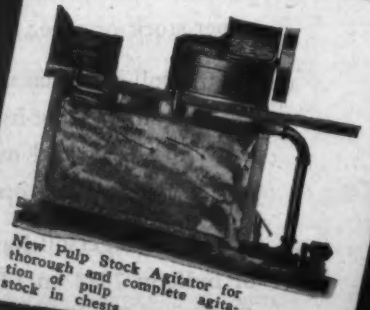

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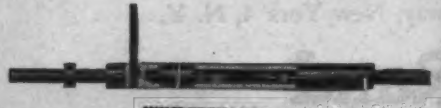

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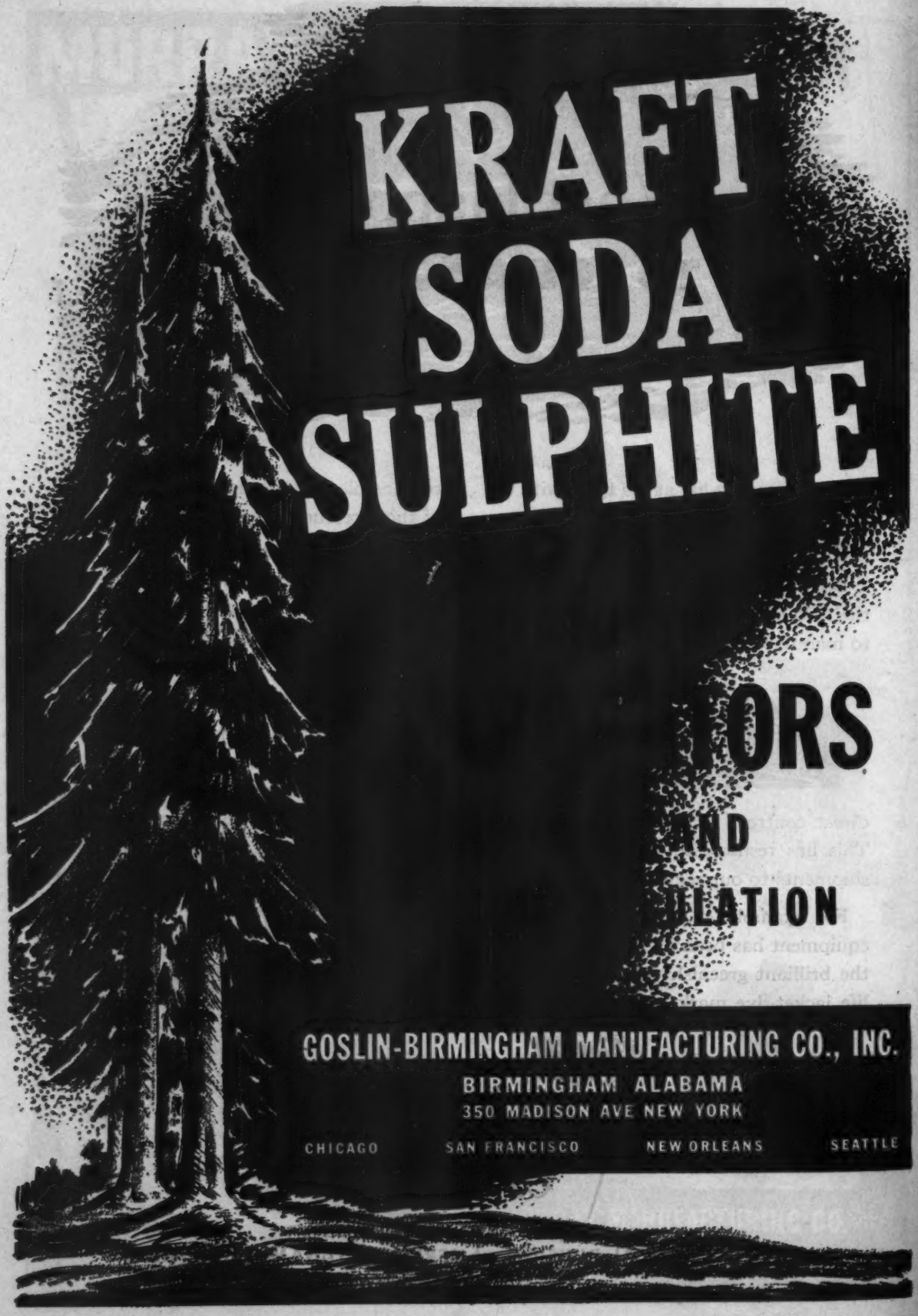
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pH of Paper Coating Important Factor in the Drying of Lithographic Ink*

By Robert F. Reed[1]

Abstract

A portion of a study on the drying of lithographic inks is given in which the degree of alkalinity of the coating is shown to be a factor. A coating which tends toward slightly alkaline or neutral conditions tends to retard the drying of the ink while an increasing pH causes faster drying. There is a practical limitation on the alkalinity of the coating because of the effect on the press fountain solutions.

Part of a general research into the drying of lithographic ink made for the lithographic industry by its own organization for cooperative research and education, was a study to determine why the rate of drying of ink varies so much on coated papers. It has long been known that serious drying troubles frequently occur, especially at high relative humidities, on this type of stock even when its absorptive qualities are right. Extracts from the results of this study, as reported fully in The Drying of Lithographic Ink *(1)* are given here because the findings have a bearing on the manufacture of offset coated paper.

The drying of a lithographic ink is the process by which it is transformed from its original semifluid or plastic state to a solid capable of withstanding the conditions to which the printed article must be subjected in use. The drying action (Fig. 1) takes place in two stages—first, by "setting," or absorption of the ink vehicle by the paper through capillary action, and second, by hardening of the ink left on the paper surface, through the chemical reactions of oxidation and polymerization of its vehicle.

Of the seven factors which must be considered in the drying of lithographic ink, paper is one of the most important. It affects drying in at least two ways: (1) its surface absorbency or permeability determines the rate of setting or absorption drying, and (2) its chemical properties (acidity or alkalinity) retard or accelerate drying of ink by oxidation and polymerization. Actually the only part of the paper involved in the drying of ink is the surface layer to a depth of not over 0.00025 inch, so with coated papers only the coating affects drying action.

* Contribution to the Superintendents Number of the PAPER TRADE JOURNAL.

[1] Member TAPPI; Director of Research, Lithographic Technical Foundation, Cincinnati, Ohio.

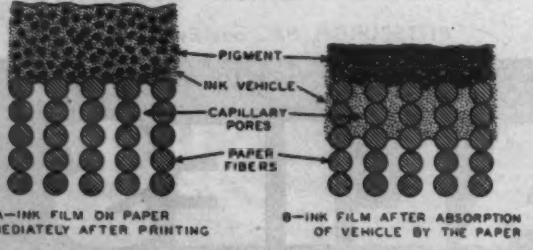

FIG. 1
Greatly Enlarged Diagrams Showing Capillary Action Between Ink and Paper

The conclusion drawn from the results of the study as detailed in the following paragraphs was that with coated papers, pH value and absorptive properties of the coating appear to be the most important factors affecting the drying of ink. Coatings which have pH values above 8.0 are most conducive to rapid drying at all humidities, but particularly so at high humidities. Coatings with pH values below 8.0 produce slower drying even at low humidities, but retard drying to a much greater extent at high humidities than the more alkaline coatings. Incidentally, although there is also a wide range of drying properties among uncoated papers at high relative humidities, the pH of an uncoated paper offers no clue to its drying properties. Uncoated papers are usually below pH 6.0.

Test Procedures

Samples of eleven different commercial coated papers were obtained and analyzed as follows:

1. Alkalinity of the coating. The coating was removed from 4 square inches of paper with a razor blade, extracted for 30 minutes in 10 ml. of distilled water, and the pH value of the extract determined electrometrically, using a glass electrode.

2. Type of coating pigment. The coating removed from each paper was analyzed qualitatively in accordance with TAPPI Standard Method T 421 m-43.

3. Weight of coating. The amount of coating per unit area was determined in accordance with TAPPI Standard Method T 407 m-42.

The following tests were then run to determine physical characteristics of the papers that might conceivably contribute to the rate of drying of ink:

1. Relative absorptiveness. The relative absorptiveness or surface permeability was determined by applying K & N Testing Ink, removing it after exactly 2 minutes, and measuring the reflection density of the resulting blue stain with the Eastman Transmission and Reflection Densitometer.

2. Ink receptivity. Samples of the papers were printed, using a solid plate carrying a uniform ink film of approximately 6 microns (0.00024 inch) thickness. Under the conditions the character of the paper surface was the only factor that could affect the amount of ink transferred. The samples were weighed before and after printing and the weight of ink actually transferred to the paper, in milligrams per square inch, was used as an index of ink receptivity.

3. Drying rate. Drying tests were run at different relative humidities by means of the Drying Tester shown in Fig. 2. The Drying Tester was developed especially for this work because of the need for greater accuracy and convenience than was possible with the manual rub test. Its operation is briefly as follows:

A strip of printed paper is attached to a ⅛-inch steel plate and this plate is placed on the belt traveling at a known speed. A strip of clean supercalendered paper is also attached to the leading edge of the plate and suspended slightly above the printed strip. As

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the plate travels forward, the weighted plunger is periodically dropped on the clean strip, forcing it into contact with the printed strip. As long as the printed strip is "wet," the ink offsets onto the clean strip, producing a series of dots. When the ink becomes dry it no longer offsets. The result is a "dot track" on the clean paper strip, the length of which is a record of drying time.

The Drying Tester as constructed has eight plungers and is capable of testing eight printed strips simultaneously. It is enclosed within an air-tight cabinet having air circulation and means for accurately controlling temperature and relative humidity.

Since the degree of dryness is an arbitrary value dependent on the method of testing, the weights of the plungers were adjusted experimentally so that the drying times indicated by the resulting dot tracks correspond closely with the results of the manual rub test as checked by three different persons.

Repeated tests on the same ink-drier combination in the Drying Tester on different days showed that drying times could be duplicated with a maximum variation of ± 9%, e.g., with an ink having an average drying time of 8 hours, the drying time never varied more than 43 minutes in either direction. Actually the average variation was not over ± 15 minutes for successive tests.

Ink

The coated papers were printed, using two different commercial offset black inks and one experimental ink, the latter being ground on the formula:

No. 3 Linseed Varnish	70 grams
Peerless Black	30 grams

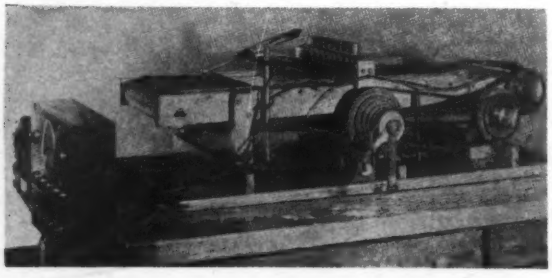

FIG. 2

The Drying Tester (Without Enclosure)

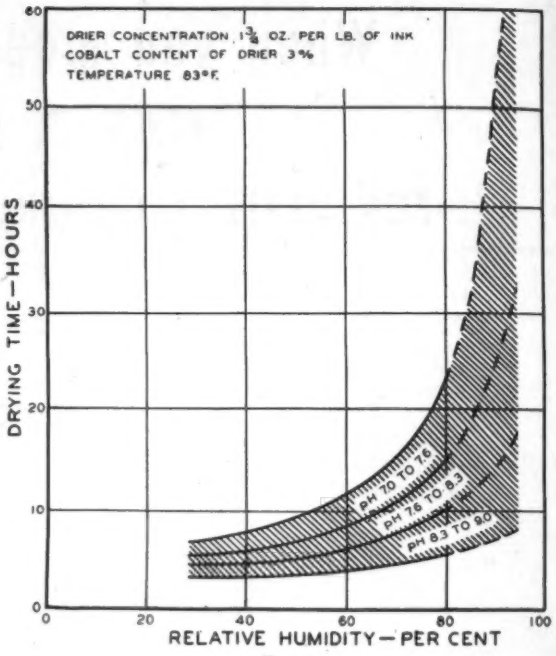

FIG. 3

Roughly General Relation Between Coating pH and Drying Time of Offset Black Ink on Coated Paper at Different Humidities

To each of these inks cobalt naphthenate was added, equivalent to 1¾ ounces of commercial drier containing 3% cobalt per pound of ink, the addition of drier being made 24 hours before printing. Four sets of prints were made and dried at 80° F. and relative humidities of 29, 43, 60, and 81%, in the Drying Tester. It had been intended to include a relative humidity of 95% but circumstances prevented this being done.

Drying Data

The drying data were such that the eleven coated papers fell naturally into three groups depending on the effect of increasing humidity on drying, namely, (1) those little affected, (2) those moderately affected, and (3) those greatly affected. These data and their classification are shown in Table I together with data from the pH determinations, K & N absorptions tests, and amounts of ink per unit area involved in the drying tests. The weights of coating

TABLE I.—RELATION BETWEEN COATED PAPER CHARACTERISTICS AND DRYING TIME OF OFFSET BLACK INK

Drier—Cobalt naphthenate equivalent to 1¾ ounce commercial drier containing 3% of cobalt.
Temperature 83° F.

Coated Paper	Average Drying Time of Three Inks in Hours, at Relative Humidities of: 29%	43%	60%	81%	pH Value of Coating	K & N Absorption Index, Density of Stain	Weight of Ink Film, Mg. per Sq. In.	Coating Pigment
Group 1								
B	3.0	2.9	3.5	5.2	8.9	0.42	2.9	Clay-barium sulphate
F	3.0	3.2	4.6	5.3	9.2	0.53	3.4	Calcium carbonate
C	3.5	3.8	4.2	5.2	9.8	0.49	3.7	Calcium carbonate
E	3.7	3.9	4.5	5.2	8.7	0.40	1.2*	Calcium carbonate
A	3.1	3.7	3.1	7.8	8.3	0.50	3.5	Clay-calcium carbonate
Average ...	3.3	3.5	4.0	5.7	9.0	0.47	3.4	
Group 2								
D	3.2	2.8	4.2	14.0	8.9	0.38	3.5	Calcium carbonate
I	3.4	4.1	8.2	13.0	7.5	0.44	3.7	Clay
G	3.1	3.7	7.0	14.0	8.2	0.42	2.7	Clay
Average ...	3.2	3.5	6.5	13.7	8.2	0.41	3.3	
Group 3								
H	4.5	4.9	10.0	24.0	7.3	0.31	2.8	Clay
J	5.1	6.3	9.9	16.3	7.3	0.22	3.1	Clay
K	7.0	8.3	11.9	18.9	7.7	0.38	3.5	Calcium carbonate Barium sulphate
Average ...	5.5	6.5	10.6	19.7	7.4	0.30	3.1	

* Probably in error and therefore omitted from average.

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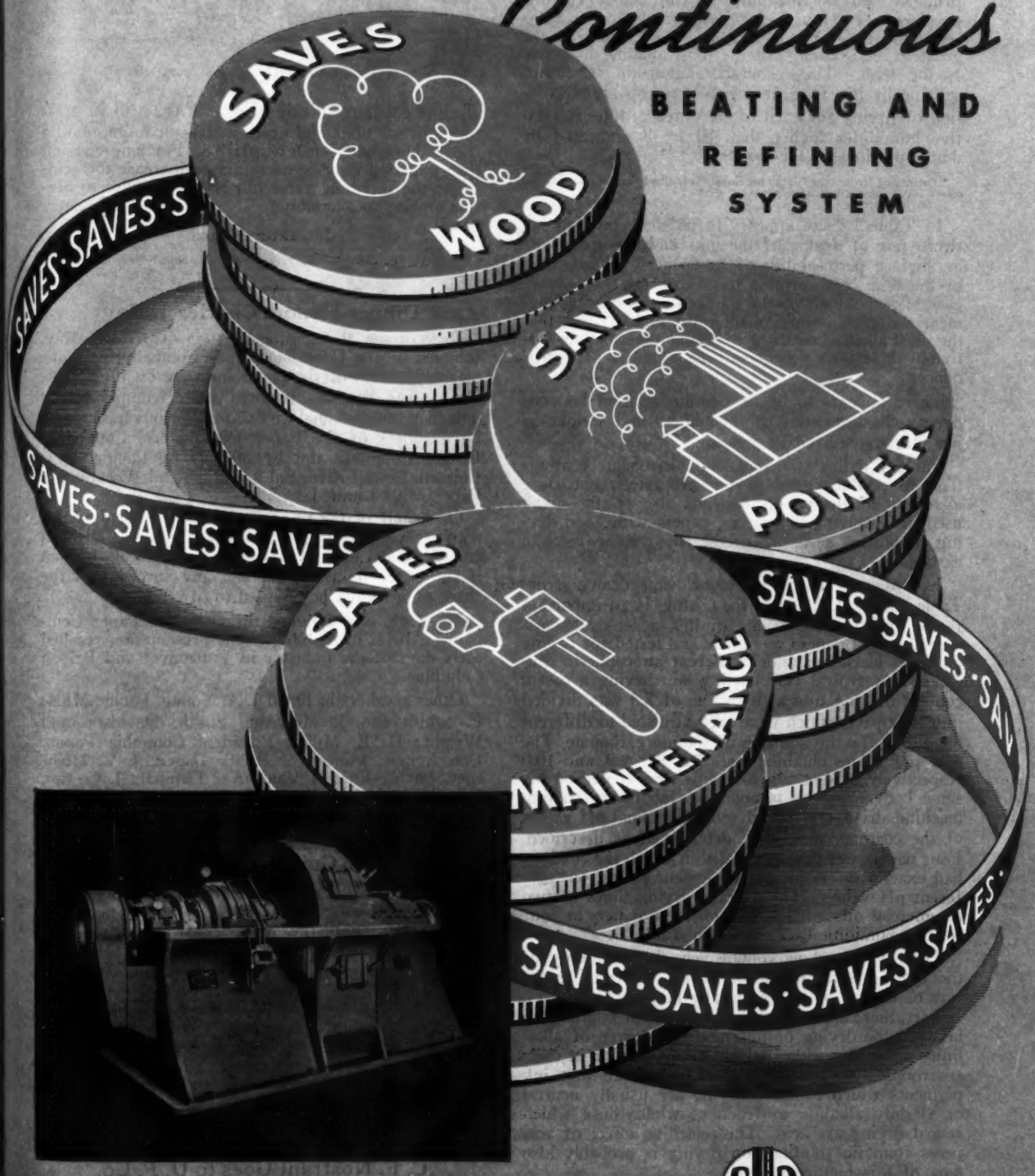

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per ream of paper were omitted because there was no correlation between them and the drying properties of the papers.

From Table I it will be seen that the retarding effect of humidity on drying of the inks depends primarily on the alkalinity of the paper coating, measured as pH value. The least alkaline coatings represented by the papers in group 3 showed the greatest retardation, and the most alkaline in group 1, the least. This general relationship is shown graphically in Fig. 2, in which the probable retardation of drying for each of the three groups at relative humidities higher than 81%* is indicated by dotted portions of the curves.

* Estimated from the data previously obtained in the drying of offset black ink on uncoated papers.

In Table I there appears to be some relation between rate of drying of the inks and absorptiveness or surface permeability of the papers, as indicated by the K & N absorption test. Absorptiveness, however, depends both on the nature of the coating pigment and the casein-pigment ratio, and the fact that the most alkaline coatings were also the most absorptive in these tests may have been a matter of coincidence.

There appears to be no definite relation between drying characteristics of the papers and weight of ink film transferred in printing.

Table I indicates that calcium carbonate coatings tend to produce good drying properties, but since alkalinity of the papers depends also on the alkali used in dissolving the casein, papers with good drying properties need not necessarily contain calcium carbonate.

In order to check the conclusion drawn from Table I that alkalinity of the coating is an important factor affecting the drying of ink, a set of experimental coated papers was made and tested for drying of offset black ink under different atmospheric conditions. A typical clay coating slip having a casein content of 16% and a pH value of 7.3 was divided into four parts which were then adjusted to different alkalinities by the addition of sodium carbonate. The final pH values obtained were 7.3, 8.0, 8.9, and 10.0 respectively. These adjusted slips were coated on the same body stock by means of a laboratory coating machine, dried, and calendered.* The final pH values of the coatings were then determined as described. Four papers were thus provided in which the coatings had exactly the same casein-pigment ratios, but different pH values. The average drying times of two commercial offset black inks on these papers at four relative humidities are shown in Table II.

These values show conclusively that alkalinity of the coating is an important factor determining the rate of drying of ink, especially at high humidities. In fact, there appears to be some general relationship between the drying of inks and the degree of alkalinity or acidity, either within themselves or in their environment. Preliminary results indicate that ink pigments which promote drying are usually neutral or slightly alkaline in reaction, while those which retard drying are acid. The retarding effect of acid press fountain solutions on drying is probably also part of this picture.

There is, of course, a practical limit to the alkalinity of coatings on lithographic coated papers. Highly alkaline coatings quickly neutralize the acid in press fountain solutions and make it difficult to maintain a reasonable acidity such as pH 3.8. For long runs on such papers it may be necessary to increase the acidity of the fountain water to pH 3.6 in order to prevent tinting or scumming.

* The experimental coated papers were prepared in the Research Laboratory of the Champion Paper and Fibre Company.

TABLE II.—EFFECT OF ALKALINITY OF PAPER COATING ON THE DRYING OF INK

pH Value of Coating Slip	pH Value of Coating	Drying Time in Hours at Relative Humidities of 43%	59%	80%	92%
10.0	8.7	4.6	4.1	6.3	34.2
8.9	8.0	4.8	6.0	9.0	50+
8.0	7.4	6.2	6.5	11.6	50+
7.3	7.5	7.3	8.2	16.0	50+

Casein in coating, 16%.
Drier—Cobalt naphthenate equivalent to 1¼ ounces of commercial drier containing 3.0% of cobalt.
Temperature, 83° F.
Drying times given are averages for two commercial offset blacks.

Literature Cited

1. Research Bulletin No. 13, Lithographic Technical Foundation, New York, N. Y.

Dinner Honors Charles J. Kay

VANCOUVER, B. C., June 18, 1945—Charles J. Kay, founder of the Columbia Paper Company, and one of the pioneers of the paper industry on the Pacific Coast, was recently honored by a complimentary dinner in the Terminal City Club, Vancouver, tendered by members of the Paper Distributors' Council of British Columbia and by officials of Pacific Mills Limited, Powell River Sales Limited and Westminster Paper Mills Limited.

On behalf of the Council, Mr. Kay was presented with a silver tray by Fred Smith of Smith, Davidson and Wright, Limited, chairman. Smith declared that if the paper industry had had any success, a large share of it should be credited to Mr. Kay.

Mr. Kay, who founded the Columbia Paper Company in 1911, in replying to the presentation recalled early days of the industry in Vancouver and British Columbia.

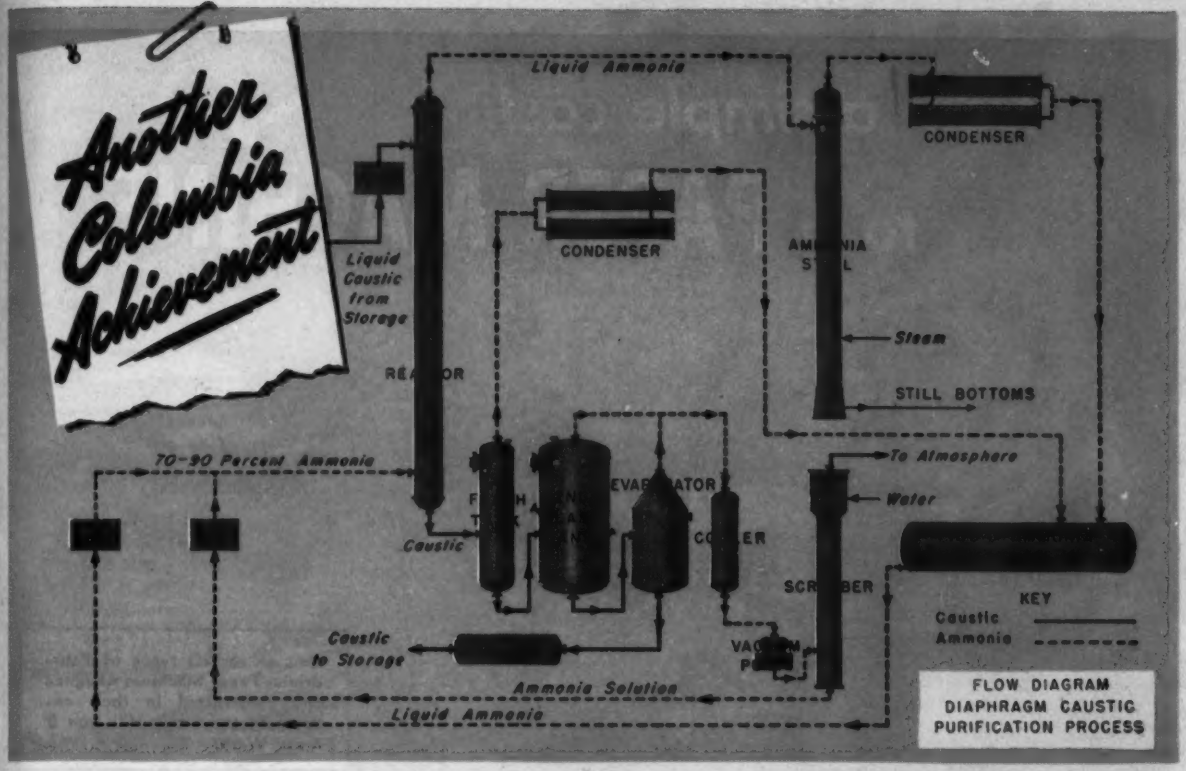
Other speakers included J. A. Young, Pacific Mills; F. Smith and J. McLaren, Smith, Davidson and Wright; H. E. Miller, President Columbia Paper; Don Agnew, Vancouver Pacific Paper; J. V. Michener, Barber-Ellis of Vancouver Limited; J. Cowan, Distributors' Council and F. W. Arthurs, Barber-Ellis Limited.

Walter Guild Heads B.T.A.E.

BOSTON, Mass., June 18, 1945—Walter R. Guild, managing director of the New England Paper Merchants Association, Inc., was elected president of the Boston Trade Association Executives June 11. This organization, which is affiliated with the American Trade Association Executives, is composed of sixty-four managers of National, Regional, and State trade associations. Other associations managed by Mr. Guild are: Massachusetts Warehousemen's Association, New England Manufacturing Confectioners Association, Cigarette Merchandisers Association of Massachusetts, and Master Metal Finishers Association of New England, Inc.

C. F. Nostrant Goes to U. P. Co.

C. F. Nostrant has become associated with the United Paperboard Company as purchasing agent. Mr. Nostrant was formerly connected with the Upson Company for many years.



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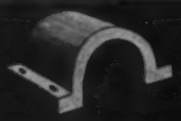

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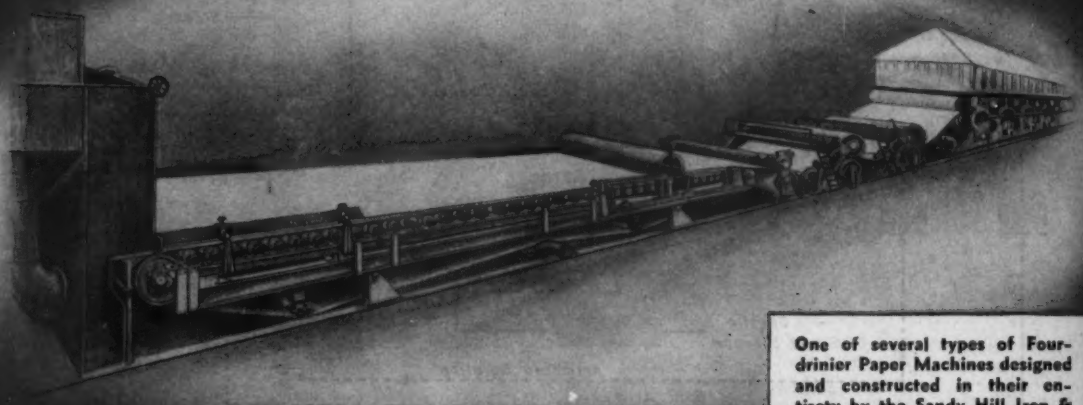

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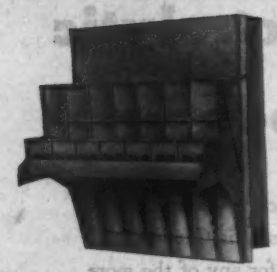
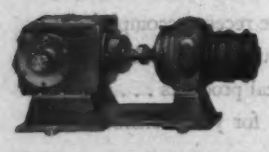


FLOW CONTROL UNIT



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Applications for the Branched Polymer Fraction of Starch*

By Ralph W. Kerr[1] and Norbert F. Schink[1]

Abstracts

Several applications for the commercial use of the branched polymer fraction of starch, or of starches which are composed essentially of branched polymers, are discussed. In these, starch products have been used previously or their use attempted with various results. The common starches are mixtures of two types of polymers which possess dissimilar colloidal characteristics and it is shown that in several applications the branched polymer fraction is either more effective or possesses better working properties, or both, than the linear polymer fraction. These are principally for sizing paper pulp at the beaters, for increasing the water retention of oil well drilling muds, and for general uses as sizes or as suspension and emulsification agents.

The chemistry of the starches with particular reference to the application of starch in paper sizing operations has been discussed by Kerr *(1)*. It has been indicated *(2)* that the utility of a starch as a size, adhesive, or colloidal suspension agent depends upon the nature and proportion of the component polysaccharides in the starch since, in general, starches are a mixture of two types of dissimilar polymers, one of which may be designated as linear and the other branched. The general properties of each type have been given and it was suggested that the branched type of polymer (also called the amylopectin fraction of starch) is the more suitable for many sizing operations and for use as a colloidal suspension agent. The linear polymer (also called the amylose fraction of starch) may confer on a mixture of the two components less desirable characteristics: colloidal instability or retrogradation (spontaneous precipitation), gel formation and the end result, discontinuity of size or adhesive film when solutions of the starch product are applied. In this report the results of experiments with starch products in several applications of commercial importance are given and these results confirm the theoretical discussions *(1, 2)*.

In order to obtain the branched polymer fraction of starch (or products which possess the characteristics of a branched polymer fraction) several ways are available. The whole starch may be modified in such a manner that either the less desirable linear polymer is preferentially degraded, is induced to polymerize to form more of the branched type of polymer or is otherwise altered in its characteristics *(22)*. The native starch may be fractionated so that the amylose is separated from the amylopectin. It is now known that certain varieties of starch, the so-called waxy types, are composed substantially of pure amylopectin and are naturally free from the linear polymer fraction. The first procedure, involving a modification of whole starch, is particularly adaptable to the preparation of sizes for certain operations, e.g., surface sizing paper *(22)* and warp sizing textile yarns, and to the preparation of liquid adhesives which are made with a low ratio of water to dry solids. In these instances, the high viscosity of the native starch or of its unmodified branched polymer constituent is not desirable since the mechanics of the application requires a product of relatively high fluidity when it is prepared at a concentration of a pound, or more, to a gallon of water. However, several important applications for starch exist in which a product of high viscosity is required. For these applications, in order to obtain the branched polymer fraction in a state as nearly undegraded as possible, fractionation may be employed, or use may be made of a waxy starch, e.g., waxy maize or waxy sorghum. The present report deals with the application of the undegraded branched polymer component of starch.

Fractionation of starch may be accomplished by one of several methods: extraction of whole starch with hot water *(3, 4, 5, 6, 7)*, electrosedimentation of a dispersion of starch in water *(8, 9, 10)*, adsorption of the linear polymer component on such materials as cotton fibers *(4, 7, 11)* and the fractional precipitation of the linear polymer fraction by the addition of alcohols to a dispersion of the starch in water *(6, 12, 13, 41)*. The last named method was used to prepare the fractions for this study since with one variation of the method, involving the use of butyl or amyl alcohols as the precipitating agent, the efficiency obtained in the separation of components is not as much dependent on the type of starch used (e.g., corn, tapioca, or potato) as are those of the other methods.

Sizing of Paper Pulp at Beaters

Experimental

A large uniform batch of bleached spruce (sulphite) pulp was procured which was used in all tests. This was beaten in an experimental, Niagara type, laboratory beater (Valley Iron Works, Appleton, Wis.) and 405 grams of pulp (dry basis), 6.1 grams of rosin size, and 5.27 grams of alum in a total of 20 liters of distilled water was used as the furnish to each beater. The pulp was beaten for 90 minutes, using three weights (15 pounds), to a freeness of 460 ml., determined in accordance with TAPPI Standard T. The pH of the pulp mixture after adding the rosin size was 7.4 to 7.6 and after adding the alum, 5.0 to 5.2. Hand sheets were formed, dried, and conditioned and the bursting strength test was performed on several samples (twenty determinations). The average value obtained with no added starch product was taken as a base or control.

Starch products, as indicated in Table I, were added to the pulp and the amount added is expressed as the percentage by weight of the pulp in the beater. Six series of tests were run: (1) corn starch cooked to a paste at a 5% concentration of starch in water by heating for 15 minutes in a boiling water bath; (2) a 1% dispersion of the linear polymer fraction of corn starch in hot water; (3) a 3% solution of the branched polymer fraction of corn starch in warm water; (4) the linear polymer fraction of corn starch followed by the branched polymer fraction, both

* Contribution from the Research Laboratories of the Corn Products Refining Company for the Superintendents' Number of the Paper Trade Journal.

[1] Research Laboratories, Corn Products Refining Co., Argo, Ill.

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added in solutions made as indicated above: (5) a corn starch product, sold under the trade name "Amijel" which is made by passing wet starch to heated rolls on which the starch is gelatinized and dried; (6) a waxy maize starch product made by a method similar to that used in the manufacture of "Amijel" starch. The increase in the bursting strength which resulted from the addition of the several starch products, and which is expressed as the percentage increase over the bursting strength of the control is shown in Table I.

TABLE I.—INCREASE IN BURSTING STRENGTH OF PAPER SHEETS SIZED WITH STARCH PRODUCTS AT THE BEATERS

Exp. No.	Starch Product Added	% of Added Starch Retained by Pulp	% Increase in Bursting Strength over Unsized Sheets
1	2% cooked corn starch	52	5.3, 6.8, 3.9, 5.2, 4.7, 4.9 Average, 5.1
2	2% corn, linear polymer fraction	48	0.0, 0.0, 0.0, 0.0, 0.0 Average, 0.0
3	2% corn, branched polymer fraction	58	10.5, 9.2, 8.8, 11.3, 10.5, 11.3 Average, 10.4
4	½% linear, 1½% branched polymer fraction	46	8.1, 8.7 Average, 8.4
5	2% pregelatinized corn starch product	81.7	6.5, 7.8 Average, 7.2
6	2% pregelatinized waxy maize starch product	68	16.3, 15.7, 21.8, 20.1, 17.8 Average, 18.3

The "Amijel" starch used was a commercial sample which was manufactured by procedures described in patents issued to Gieseke *(15)*. Inasmuch as the waxy starches lend themselves to modification in the same way as ordinary corn starch, the roll-dried, waxy maize starch product was made by the use of similar procedures, but to compensate for the larger amount of water which is absorbed as the waxy maize starch gelatinizes, the starch was fed to the heated drying rolls as a slurry at a density corresponding to 22°Be'. Waxy maize products of this type, as well as those of the noncereal starches, disperse very poorly and for this reason it is customary to add a dispersing agent to prevent products of this nature from balling up into mucilaginous masses. One half of one per cent of borax (based on the dry weight of the starch) was added to the starch slurry which was fed to the heated rolls in order to aid the redispersion of the product in the beaters.

Discussion

It is obvious that the effective component of starch for sizing paper pulp is the branched polymer fraction. This may be a surprising result inasmuch as Kerr and Severson *(7)* have shown that cellulose fibers readily adsorb the unbranched component of corn starch which result is in harmony with the statements of Tanret *(4, 16)*, Samec *(17)* and Pacsu and Mullen *(11)* that one fraction of starch (amylose) is selectively adsorbed by cellulose and that another is not adsorbed. Approximately one half of the added linear polymer fraction, or 1% (of the weight of the pulp) was retained in the sizing tests reported. However, no increase in the bursting strength of the finished sheet was observed. Apparently the linear polymer fraction of corn starch is able to orient with other linear polymers such as cellulose, in much the same irreversible manner as it orients with itself so as to prevent the formation of a continuous film. The result is a bond from fiber to fiber of low tensile strength. This result was anticipated by Kerr *(1)*. Another surprising observation is the high percentage of the branched polymer which is retained by the paper pulp, nearly 60% of the amount added to the beater. Since this starch fraction is not adsorbed, it is probably either held mechanically by absorption or the fraction is partially precipitated on the fibers by the other adjuncts which are added to the beater, such as the rosin size or alum. A very substantial increase in the bursting strength of the paper results, confirming the views of Kerr *(1)*.

It was thought that if the linear polymer fraction were first adsorbed onto the pulp a better base might be formed from which the branched polymer fraction could form a stronger bond between the fibers. Experiment 4 shows that this result does not follow and that only the effect anticipated from the amount of added branched polymer is obtained.

Experiment 5 shows that the bonding strength of starches is not necessarily a simple function of the percentage which is retained by the pulp, for although the physical state of corn starch may be altered by gelatinization, drying and grinding so that as high as 80% of the added starch product is retained, the increase in bursting strength which results is less than half of the value obtained by the addition of a similarly made product, in the manufacture of which an almost pure, branched polymer-starch was used and which was retained by the pulp to a lesser extent. Experiment 6 shows that although 68% of the roll-dried, waxy maize starch product was retained by the pulp, the bursting strength of the paper sheet increased 18.3% because of the addition of this starch size.

Oil Well Drilling Muds

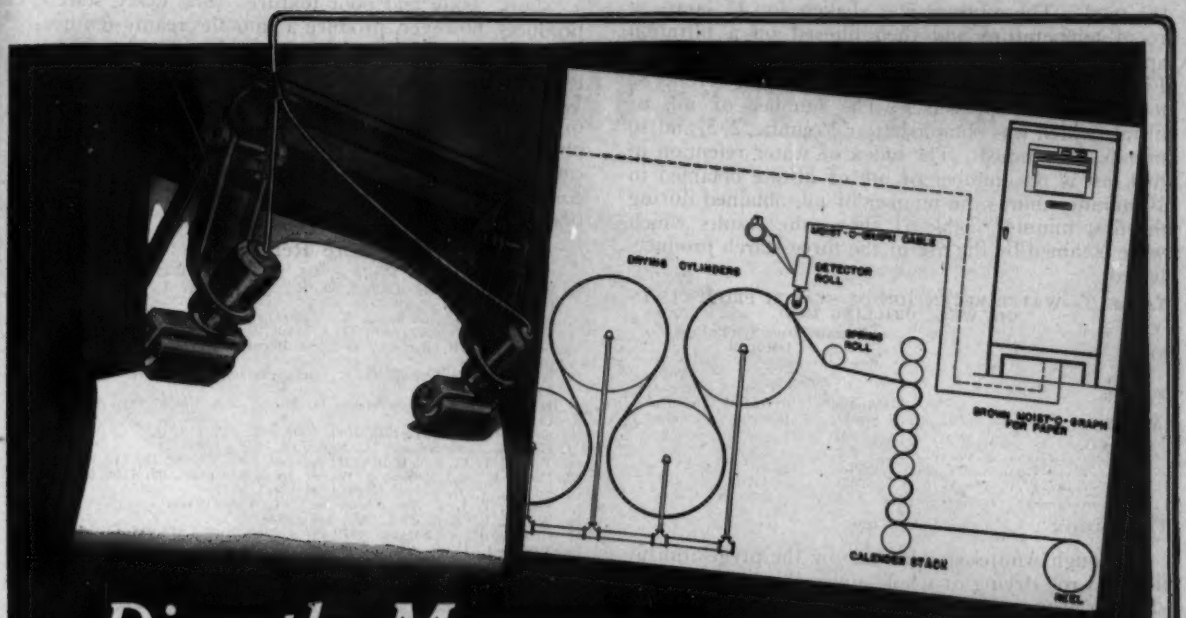
A suspension of prepared mud is used in the drilling of shale oil wells to float the drillings to the surface. Starch products are added to these muds for the purpose of reducing the loss in water to the formation which loss would otherwise follow when the muds are pumped down into the wells *(18, 19, 20)*. A loss of water increases the viscosity of the mud and therefore makes the circulation of the mud more difficult. A gelatinized corn starch is suited for use particularly in salt laden muds since its properties are not as adversely affected by salt as are other usable colloids. Pregelatinized starches or cold water dispersible products are generally used because facilities for cooking starch are rarely available in the oil fields.

Experimental

Amijel starch previously described, was tested for its water absorption value in oil well drilling muds and was compared against the branched polymer fraction of corn starch and a pregelatinized roll-dried material made from a waxy starch. Waxy sorghum starch (from red leoti grain) was selected for this particular test although waxy starches of other origins, such as that of waxy maize, give comparable water absorption values. The product was made by feeding a water suspension of the starch at a concentration corresponding to 22°Be' to heated rolls such as are used in the manufacture of Amijel starch. The roll-dried product was ground so that it would pass a 70-mesh screen. Borax was omitted since the manner of using the product provides ample agitation and time to mix the prepared starch into the drilling mud and a dispersing agent is not necessary.

A sample of oil-well drilling mud* was procured which showed a dry solids content of 29% and 1.8 gram of dry starch product were added to 150 cc. of

* A proprietary preparation supplied by the Baroid Sales Division of the National Lead Co., Los Angeles, California.



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the mud. The mixture was shaken for 17 hours at room temperature and then filtered on a filtration apparatus commonly used in this type of testing. Filtration was accomplished by applying from 83 to 85 p.s.i. of pressure. The number of ml. of filtrate which was obtained after 1 minute, 2, 5, and 10 minutes was noted. The index of water retention in this test is the number of ml. of filtrate obtained in 10 minutes minus the number of ml. obtained during the first minute. Table II shows the results which were obtained by the use of the three starch products tested.

TABLE II.—WATER RETENTION OF STARCH PRODUCTS IN OIL WELL DRILLING MUD

Filtration Time Minutes	Filtrate from Starch Products Used, ml. "Amijel" Starch	Corn, Branched Polymer	Waxy Sorghum, Roll-Dried Product
1	7.0	1.5	0.3
2	9.5	2.1	0.8
5	14.5	3.1	1.5
10	20.5	4.3	2.6
10-1	13.5	2.8	2.3

DISCUSSION

Although Amijel starch made by the pregelatinization and roll-drying of whole, unmodified corn starch, shows a water retention index of 13.5 in oil well drilling mud, other starch products which are prepared especially for this purpose and which are sold under well known trade names give values in a range of 6 to 8 by this test *(20)*. The values obtained for the branched polymer fraction of corn starch and for starch products that consist entirely of branched polymers are, however, the lowest values which have been obtained by us for any starch product.

In high concentration the water retention of the linear polymer fraction of corn starch compares favorably with other colloids but the solution tends to gel. This effect increases the viscosity abnormally of a mud mixture and therefore defeats the very purpose for which the colloid is added: to maintain the viscosity of the mud while being circulated within a suitable working range. At low concentration, the water absorption of the branched polymer is superior to the linear in this application.

The results discussed should leave no doubt that considering starch as a mixture of two types of polymers, the branched one is unquestionably the more desirable and effective constituent of starch for use in oil-well drilling mud.

Other Applications

Other applications which suggest themselves for the branched polymer or for the easily dispersed, cold water soluble preparations of the starches which contain only branched polymers, are their use as colloidal suspension agents and emulsification agents, particularly for food products in which other colloids which may be more effective agents are undesirable for various reasons. For example, the branched polymer of starch is particularly suited for use as an emulsifying agent in the preparation of salad dressings. Another application, particularly for a pregelatinized waxy maize or sorghum starch product, the results of which cannot readily be expressed quantitatively, is for use as a suspension agent in the preparation of creamed soups, sauces and gravies and canned foods. Similar products made from the noncereal starches have high suspending values, nevertheless they produce a stringy or "long" body in such preparations. The cereal starch products (except those especially modified for the purpose *(21)* produce a "short" body and poor texture. The waxy starch products, however, produce a smooth creamy texture which is greatly desired by the trade. The branched polymer fraction of starch is also especially suitable for certain textile sizing operations, e.g., the finishing of textile fabrics. The branched polymer fraction is obviously preferred for these and many other applications for starch products when the differences in the colloidal properties of the two major starch fractions are considered and appreciated.

Literature References

1. Kerr, R. W., *Paper Trade J.*, 115, No. 22: 30 (1942).
2. Kerr, R. W., and Trubell, O. R., *Paper Trade J.*, 117, No. 15: 25 (1943).
3. Maquenne, L., and Roux, E., *Compt. rend.*, 140, 1303 (1905).
4. Tanret, C., *Compt. rend.*, 158, 1353 (1914).
5. Meyer, K. H., Bretano, W., and Bernfeld, *Helv. chim. Acta*, 23, 845 (1940).
6. Kerr, R. W., Trubell, O. R., and Severson, G. M., *Cereal Chem.*, 19, 64 (1942).
7. Kerr, R. W., and Severson, G. M., *J. Am. Chem. Soc.*, 65, 193 (1943).
8. Samec, M., and Haerdtl, Koll, *Beih.*, 12, 281 (1920).
9. Hess, K., and Krajnc, B., *Ber.* 73B., 976 (1940).
10. Taylor, T. C., and Iddles, H. A., *Ind. Eng. Chem.*, 18, 713 (1926).
11. Pacsu, E., and Mullen, J. W., *J. Am. Chem. Soc.*, 63, 1168 (1941).
12. Schoch, T. J., *Cereal Chem.*, 18, 121 (1941).
13. Schoch, T. J., *J. Am. Chem. Soc.*, 64, 2957 (1942).
14. Wiegel, E., *Koll. Zeit.*, 102, 145 (1943).
15. Gieseke, F., U. S. pat. 1,979,257 (1934), and 1,974,915 (1934).
16. Tanret, C., *Bull. Soc. Chim.*, 17, 83 (1915).
17. Samec, M., *Ber.* 73A, 88 (1940).
18. Perkins, F., and Craft, B. C., *Petroleum Technology*, January (1943).
19. Perkins, F., and Craft, B. C., *Am. Inst. Mining Met. Engrs., Tech. Pub.* No. 1551 (1943).
20. Sawdon, W. A., *Petroleum Engineer*, p. 115, July (1943).
21. Kerr, R. W., U. S. pat. 2,332,320 (1943).
22. Kerr, R. W., and Schink, N. F., *Paper Trade J.*, 120, No. 8: 145 (1945).

Gilbert Co. Signs Labor Contract

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 18, 1945—Representatives of the International Brotherhood of Papermakers and the Gilbert Paper Company, Menasha, Wis., on Tuesday, June 12, signed their first labor contract, involving hourly wage boosts, vacations with pay, E. B. Lambton, regional director of the union, announced at Appleton, Wis. The contract will continue in effect until May 31, 1946, if it is approved by the War Labor Board.

Included in the agreement are a maintenance of membership clause, a 3 cent hourly increase for men and women working shifts and an extra 4 cents per hour for all women, both shift workers and others, bringing the minimum for women to 55 cents per hour. Machinery is set up for arbitration of grievances and complaints, and vacations with pay of 48 hours for workers with a year of service and up to five years and 96 hours with pay for workers having more than five years of service.

Increases Pulpwood Ceiling Prices

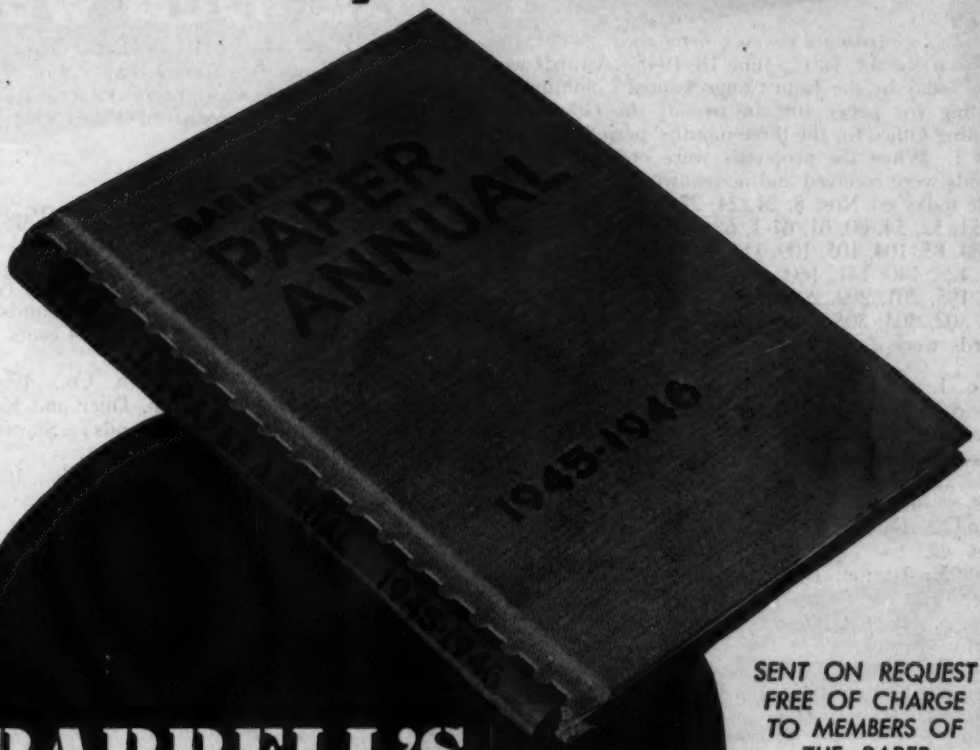
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 20, 1945—To encourage the peeling of pulpwood, ceiling prices for peeled poplar pulpwood produced in Minnesota, Michigan and Wisconsin are being increased $1 per cord, the Office of Price Administration announced today. This is Amendment No. 4 to RMPR No. 257.

The increase, which becomes effective June 14, 1945, will be absorbed by pulp and paper mills buying the pulpwood. It will not serve as the basis for any advance in the ceiling prices of products made from the pulpwood, since the handling of peeled wood permits savings to mills in transportation and other costs, OPA said.

The new ceilings for peeled poplar are $12.50 per cord of 128 to 133 cubic feet of 96-inch or 100-inch poplar, and $14.40 for a unit of 147 cubic feet of 55-inch poplar.

Reserve yours NOW!



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1945 - 1946

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STREET_____

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Joint Congressional Committee Makes Awards for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 18, 1945—Awards were made today by the Joint Congressional Committee on printing for paper for the use of the Government Printing Office for the three months' period beginning July 1. When the proposals were opened June 11, no bids were received and no awards were, therefore, made today on Nos. 8, 21, 24, 27, 29, 34, 39, 41, 42, 43, 51, 52, 54, 60, 61, 61-1, 62, 64, 67, 69, 70, 72, 73, 78, 84, 85, 104, 105, 109, 111, 120, 121, 122, 123, 125, 126, 128, 140, 141, 160, 161, 168, 169, 176, 177, 183, 185, 195, 201, 202, 204, 205, 209, 211, 219, 276, 277, 301, 302, 303, 305, 308, 311, 352, 360 and 367. The awards were as follows:—

No. 1. Old Dominion Paper Co., ceiling price at time of shipment, (1,000,000 pounds). Marquette Paper Corp., rejected.

No. 2. Birmingham and Prosser Co., 5.38 cents.

No. 3. Barton, Duer and Koch Paper Co., 7.97 cents.

No. 4. Barton, Duer and Koch Paper Co., 7.97 cents.

No. 5. Barton, Duer and Koch Paper Co., 7.95 cents.

No. 6. Barton, Duer and Koch Paper Co., 7.55 cents.

No. 7. Central Ohio Paper Co., 7.53 cents.

No. 9. Central Ohio Paper Co., 7.53 cents.

No. 10. Barton, Duer and Koch Paper Co., 7.40 cents.

No. 18. Mead, Sales Inc., 7.18 cents.

No. 19. Paper Corp. of U. S., 9.27 cents (500,000 pounds).

No. 20. Central Ohio Paper Co., 8.13 cents (150,000 pounds).

No. 22. Mead Sales Co. Inc., 7.18 cents.

No. 23. Graham Paper Co., 8.82 cents.

No. 26. Whitaker Paper Co., 17.10 cents.

No. 33. R. P. Andrews Paper Co., 7.72 cents (400,000 pounds); Mudge Paper Co., 7.72 cents (200,000 pounds).

No. 37. Barton, Duer and Koch Paper Co., 6.32 cents.

No. 38. Barton, Duer and Koch Paper Co., 5.87 cents.

No. 41. Consolidated Water, Power and Paper Co., 6.565 cents.

No. 44. Rejected.

No. 45. R. P. Andrews Paper Co., 7.24 cents (400,000 pounds); Barton, Duer and Koch Paper Co., 7.27 cents (500,000 pounds).

No. 46. Cauthorne Paper Co., 8.35 cents.

No. 47. Aetna Paper Co., 9.93 cents.

No. 48. Rejected.

No. 49. Rejected.

No. 50. R. P. Andrews Paper Co., 12.83 cents (100,000 pounds); D. L. Ward Co., 12.79 cents (100,000 pounds).

No. 53. Frank Parsons Paper Co., 6.40 cents.

No. 55. R. P. Andrews Paper Co., 7.82 cents (200,000 pounds).

No. 56. Whitaker Paper Co., 7.44 cents (400,000 pounds).

No. 57. R. P. Andrews Paper Co., 7.59 cents (450,000 pounds); Mudge Paper Co., 7.615 cents (400,000 pounds); Cauthorne Paper Co., 7.63 cents (400,000 pounds); Stanford Paper Co., 7.63 cents (800,000 pounds).

No. 58. No award.

No. 59. Rejected.

No. 61-2. Barton, Duer and Koch Paper Co., 8.83 cents.

No. 63. Aetna Paper Co., 12.37 cents.

No. 65. Stanford Paper Co., 15.56 cents (sub. 48), 15.46 cents (sub. 56), 200,000 pounds.

No. 66. Mudge Paper Co., 18.04 cents (sub. 32), 17.68 cents (sub. 40).

No. 68. Franklin Research Co., 19.425 cents (1,030,000 pounds); Barton, Duer and Koch Paper Co., 18.90 cents (200,000 pounds); Stanford Paper Co., 19.00 cents (120,000 pounds).

No. 71. Old Dominion Paper Co., 10.998 cents (100,000 pounds).

No. 75. Barton, Duer and Koch Paper Co., 26.00 cents

No. 76. Old Dominion Paper Co., 20.996 cents (50,000 pounds).

No. 77. Paper Corp. of U. S., 24.73 cents.

No. 101. Rejected.

No. 102. Rejected.

No. 103. Rejected.

No. 106. Aetna Paper Co., 14.39 cents (400,000 pounds).

No. 107. Aetna Paper Co., 14.39 cents (400,000 pounds).

No. 108. Aetna Paper Co., 14.39 cents (400,000 pounds).

No. 110. Aetna Paper Co., 15.09 cents.

No. 151. Rejected.

No. 152. Wilcox-Walter-Furlong Paper Co., 9.45 cents.

No. 153. Wilcox-Walter-Furlong Paper Co., 8.95 cents.

No. 154. Aetna Paper Co., 14.39 cents.

No. 155. Aetna Paper Co., 14.39 cents.

No. 156. Aetna Paper Co., 15.09 cents.

No. 184. Whitaker Paper Co., 7.67 cents (200,000 pounds).

No. 189. Barton, Duer and Koch Paper Co., 15.67 cents (100,000 pounds); Whitaker Paper Co., 16.40 cents (100,000 pounds).

No. 190. Barton Duer and Koch Paper Co., 15.67 cents (200,000); Walker Goulard Plehn Co. Inc., 15.60 cents (50,000 pounds).

No. 191. Barton, Duer and Koch Paper Co., 16.67 cents (200,000 pounds).

No. 192. R. P. Andrews Paper Co., 16.23 cents.

No. 196. Birmingham and Prosser Co., 26.00 cents.

No. 203. R. P. Andrews Paper Co., 8.53 cents.

No. 208. Frank Parsons Paper Co., 5.75 cents.

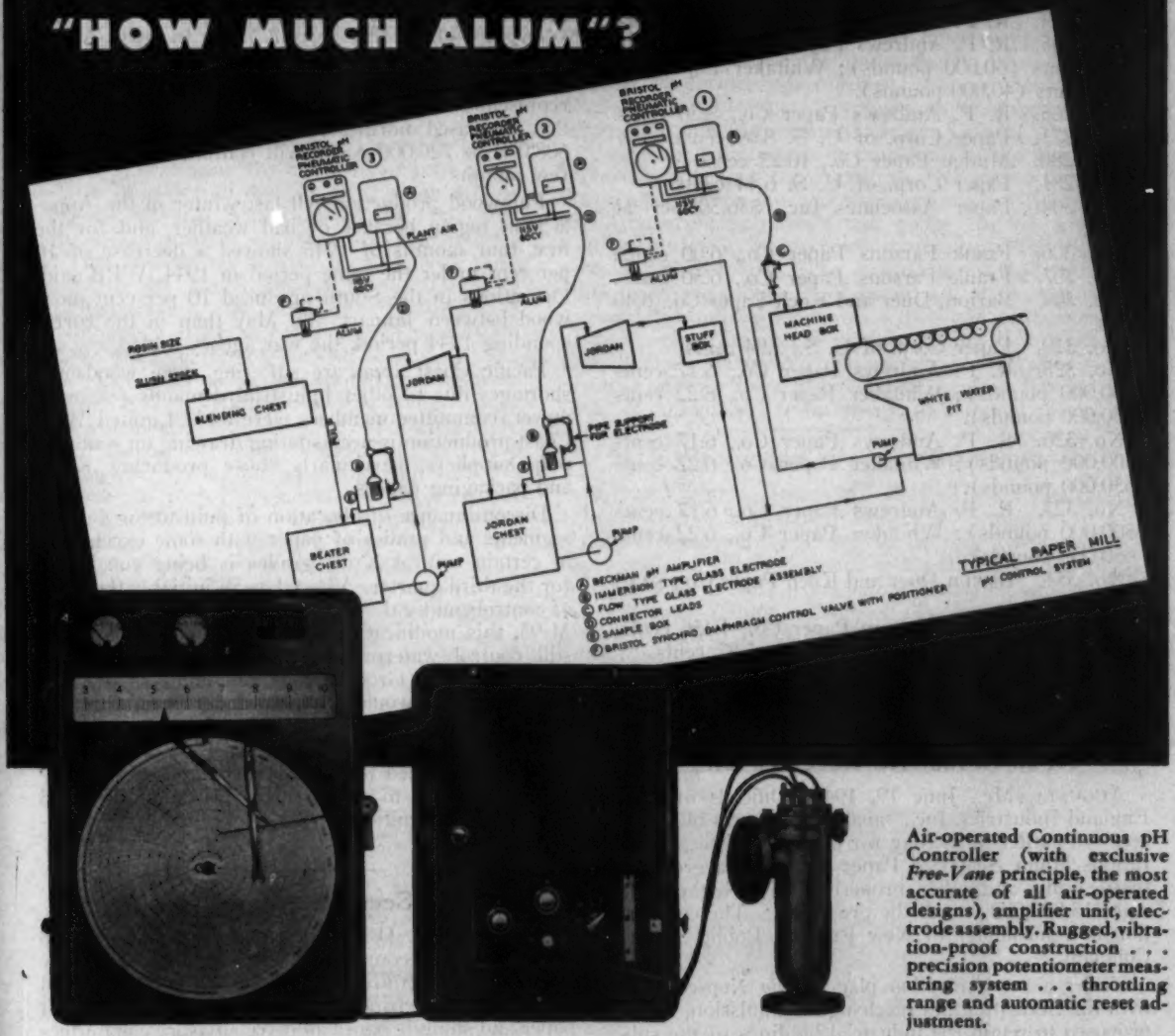
No. 210. Whitaker Paper Co., 5.905 cents (4¾ inch rolls), 5.655 cents (5¾ and 7½ inch rolls).

No. 213. Perkins-Goodwin Co., 18.00 cents (160 pound basis), 17.00 cents (280 pound basis).

No. 217. R. P. Andrews Paper Co., 4.90 cents.

Continuous, Accurate, Automatic Answer to

"HOW MUCH ALUM"?



Air-operated Continuous pH Controller (with exclusive *Free-Vane* principle, the most accurate of all air-operated designs), amplifier unit, electrode assembly. Rugged, vibration-proof construction . . . precision potentiometer measuring system . . . throttling range and automatic reset adjustment.

In this typical continuous stock preparation system, foolproof control of pH is just a matter of using the right Bristol instruments at the right places.

Most important, of course, is the final addition of alum prior to the fan pump. Electrodes placed in the stock flow to the head box or in the white water coming from the wire pit continuously signal to the Bristol pH Controller how much alum should be introduced.

Once the Controller is set at the proper pH value, that value is automatically maintained ever after, regardless of changes in the character of the stock flow.

Other points where automatic pH control will guard product quality without the necessity of having to depend on periodic sampling for test . . . are shown in the diagram (2 and 3).

Bulletin pH 1300 gives information on the complete system illustrated above. Address The Bristol Company, 159 Bristol Road, Waterbury 91, Conn. (The Bristol Company of Canada, Ltd., Toronto, Ontario. Bristol's Instrument Co., Limited, London N.W. 10, England).

Engineers Process Control for Better Products and Profits

No. 218. R. P. Andrews Paper Co., 4.90 cents.
No. 252. Barton, Duer and Koch Paper Co., $15.50 per M sheets (100,000 sheets); Whitaker Paper Co., $15.20 (100,000 sheets); Stanford Paper Co., $15.20 (100,000 sheets).
No. 254. R. P. Andrews Paper Co., 11.47 cents.
No. 255. R. P. Andrews Paper Co., 11.47 cents, 12.73 cents (60,000 pounds); Whitaker Paper Co., 11.00 cents (40,000 pounds).
No. 265. R. P. Andrews Paper Co., 8.50 cents.
No. 271. Paper Corp. of U. S. 8.69 cents.
No. 280. Mudge Paper Co., 10.25 cents.
No. 281. Paper Corp. of U. S. 6.44 cents.
No. 304. Paper Associates Inc., $36.50 per M sheets.
No. 306. Frank Parsons Paper Co., 6.00 cents.
No. 307. Frank Parsons Paper Co., 6.50 cents.
No. 309. Barton, Duer and Koch Paper Co., 6.40 cents.
No. 310. Paper Corp. of U. S., 9.94 cents.
No. 325. R. P. Andrews Paper Co., 6.17 cents (500,000 pounds); Whitaker Paper Co., 6.22 cents (650,000 pounds).
No. 326. R. P. Andrews Paper Co., 6.17 cents (500,000 pounds); Whitaker Paper Co., 6.22 cents (650,000 pounds).
No. 327. R. P. Andrews Paper Co., 6.17 cents (500,000 pounds); Whitaker Paper Co., 6.22 cents (650,000 pounds).
No. 351. Barton Duer and Koch Paper Co., $9.75 per C sheets.
No. 366. Mathers-Lamm Paper Co., 4.456 cents.
No. 368. Consolidated Paper Co., 5.87 cents.
No. 369. Mead Sales Co., Inc., 4.00 cents (caliper 60 points and up), 4.375 cents (caliper 50 points).

N. E. Industries Receives Bids

AUGUSTA, Me., June 19, 1945—Officials of New England Industries, Inc., "analyzed" tonight bids they received earlier in the day for purchase of the corporations Maine Seaboard Paper Company, a group of textile mills and other properties. The highest bid was $15,839,000 for all the properties. The corporation is a subsidiary of New England Public Service Company.

Under a reorganization plan of the Nepsco, filed with the Securities and Exchange Commission, it was proposed to retain the industrial holdings of the subsidiary, but a group of prior preferred stockholders filed an alternate plan calling for immediate divestment of the industrial companies.

Oxford Paper Company submitted a bid for the paper company, but it remained unopened pending receipt of other bids, including one from Eastern Corporation, Brewer, expected in about a week, it was announced.

Jury Convicts for Newsprint Violation

A federal jury in New York city this week returned a verdict of guilty against the Rewl Publishing Company, 500 Fifth avenue, and its president, Lindsey L. Baird on charges of having exceeded their newsprint quota in violation of the Second War Powers Act. Judge Grover M. Moscowitz set next Monday for sentence. The defendants were accused of having illegally used 300 tons to print the June, July and September, 1944, issues of *Blazing Comics and Blue Circle.*

Northeast Increases Pulp Production

WASHINGTON, D. C., June 20, 1945—Domestic pulpwood production in the northeast section of the United States increased 19 per cent in the first four months of 1945 over the equivalent period of last year, members of the Over-all Paper Industry Advisory Committee were told at their recent meeting, the War Production Board reported today. WPB representatives anticipated that the favorable trend that increased northeastern cordwood output from 608,000 to 726,000 cords will continue for the next few months.

Pulpwood production fell last winter in the Appalachian region because of bad weather, and for the first four months of 1945 showed a decrease of 16 per cent under the same period in 1944, WPB said. Operations in the South produced 10 per cent more wood between January and May than in the corresponding 1944 period, the war agency added.

Pacific Coast areas are suffering from woodsmen shortages due to other industrial demands for manpower, committee members were told. Limited West Coast production is necessitating drawing on southern pulp suppliers, particularly those producing Kraft and packaging papers.

Discontinuance of allocation of pulp to the various segments and grades of paper with some exceptions, in certain critical Kraft grades is being considered for the third quarter. Viewed as an initial withdrawal of controls under the WPB woodpulp allocation order, M-93, this modification of segment allocation would still control waterproof paper, shipping sacks and containerboard. Grocery bags and unbleached Kraft wrapping paper would be placed under certain production ceilings in order to protect the flow of paper into the more critical Kraft items, WPB said. The war agency emphasized that continuing industry cooperation is required to attain early revocation of M-93 because of difficulties involved in relinquishing controls.

WPB Sees Shortage of Kraft

WASHINGTON, D. C., June 20, 1945—Kraft pulp and paper will continue in extremely short supply throughout the third quarter because of increased demands of the armed forces, members of the kraft paper and sulphite paper industry advisory committees were informed at a recent joint meeting, the War Production Board reported today. The Army redeployment plan and increased shipments from West Coast plants of wrapping and packaging papers and shell containers, aggravated by heavy demands for containerboard, were advanced as reasons for the tight supply situation.

In general, WPB said, the pulp supply for the third quarter of 1945 will be approximately the same as during the first quarter. The war agency expresed the hope that Scandinavian shipments of pulp will increase available domestic supplies. It was also emphasized that national wastepaper collection campaigns must be intensified to maintain containerboard production in amounts adequate to meet increasing demands.

Concern was expressed by WPB officials as to the ability of West Coast mills to meet kraft paper requirements at that point. It may be necesary to divert some tonnage of finished Kraft papers from the South to West Coast areas, they said.

Canada Increases Domestic Quotas

MONTREAL, Que., June 18, 1945—The War Prices and Trade Board of Canada has announced an increase of ten per cent in the allocation of newsprint for Canadian consumption, effective for the third quarter of the year. This follows a similar increase in the allocation of Canadian newsprint to the United States, and comes as a result of the recent conference in Montreal between United States and Canadian officials.

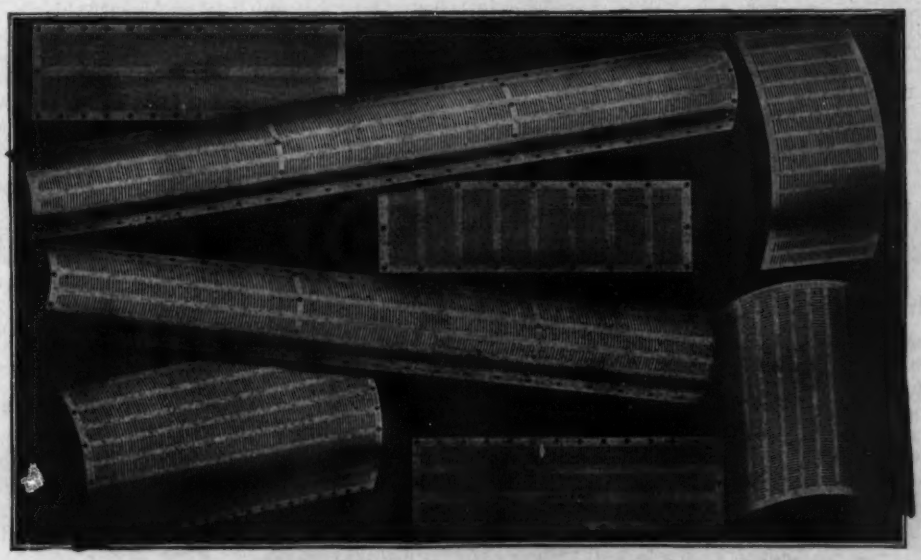
Newsprint officials here explain that this action does not necessarily mean any marked easement in the outlook for the overall supply of newsprint for the present, but that arrangements for the final destination of Canadian supplies are contributory factors. The decision had already been made to raise the supply to the United States from 200,000 to 215,000 tons a month, and certain other factors have entered into the raising of the allotment to 220,000 tons for the third quarter of the year.

Another factor lies in the decision to stop shipments from Canada and the United States to Europe, with European publishers in future to be supplied entirely with Scandinavian newsprint. This will not only save Atlantic shipping space, now at a premium with the large volume of troop movements and supplies, but will retain assured deliveries to Canadian and American publishers. It is explained here that hitherto shipments of newsprint to Europe, whether from Canada or the United States, have come out of the North American pool, requests having been routed through Washington on the understanding that any such shipments would be deducted from the total of Canadian shipments to the United States. This has obscured the position of Canada as regards supply of purely United States requirements, and for some time past the Newsprint Association of Canada, in its monthly report on production and shipments, has carried a note stating: "It has been reported in the press that the Newsprint Administration undertook to supply certain quantities of newsprint monthly to the United States. Performance under these agreements cannot be measured by the figures appearing in this report because the undertakings are largely affected by factors not reflected in these statistics. Our data, as in the past, continues to show only the movement of newsprint originating in Canada."

Meanwhile satisfaction is expressed by the manufacturers here that the American Newspaper Publishers Association has adopted a recommendation of the Advisory Committee's task group for the continued use of a 32-lb. newsprint rather than the proposed 30-lb. paper. The manufacturers had been quite ready to produce 30-lb. paper, but at the recent meeting in Montreal there was a thorough discussion of the technical reasons they advanced for their claim that, all things considered, no appreciable increase in printing surface from a given total weight of paper could be anticipated from change to a lighter stock.

H. E. Stone 2nd Weds in Brooklyn

BOSTON, Mass., June 18, 1945—Lieut. Henry Edward Stone, 2nd, son of Robert M. Stone, president and treasurer of Stone & Forsyth Company, paper dealers, who is stationed at the Brooklyn Army Base, Brooklyn, N. Y., was recently married to Miss Jane Eleanor Tipton, daughter of Mr. and Mrs. Harry Spangler Tipton, of Watkins Glen and Elmira, N. Y., in Elmira. They went to Pinehurst for their wedding trip and are living in Brooklyn. Lieut. Stone was associated with Stone & Forsyth Company before entering the service.



"HARDY" BRONZE and CHROME-NICKEL-STEEL SCREEN PLATES.

MAGNUS METAL CORP. FITCHBURG, MASS.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending June 16, 1945

STOCKS

	High	Low	Last
A. P. W.	6⅝	5¾	6⅛
Armstrong Cork Co.	47	45¾	46½
Celotex Corp.	18	17¾	17¾
Celotex Corp., pf.	21¾	20¾	21¼
Certain-Teed Products Corp.	11⅜	10¾	10¾
Certain-Teed Products Corp., pf.	160	158	160
Champion Paper & Fibre Co.	39	34½	38⅞
Champion Paper & Fibre Co., pf.	111¾	110½	110½
Congoleum Nairn Co.	30¾	29⅜	30
Container Corp. of America	30	29⅛	29⅛
Continental-Diamond Fibre Co.	12½	11⅞	12⅜
Crown-Zellerbach Co.	24½	23⅝	24½
Crown-Zellerbach Co., pf.	103⅞	103¼	103⅞
Dixie Cup Co.	29	27½	28
Dixie Cup Co.—A.	48¼	47¾	48¼
Flintkote Co.	30⅛	29½	29⅝
Flintkote Co., pf.	108½	108⅛	108½
Robert Gair	6⅞	6⅛	6⅜
Robert Gair, pf.	17⅞	17½	17⅞
International Paper Co.	29½	28	29⅛
International Paper Co., pf.	98¾	97	97
Johns-Manville Corp.	124	122	123
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	48½	48	48¼
Mac Andrews & Forbes	33	33	33
Mac Andrews & Forbes, pf.	...	...	...
Masonite Corp.	45⅛	44½	45¼
Mead Corp.	15½	14¾	15
Mead Corp., pf. A—6%	105	105	105
Mead Corp., pf. B—5½ %	100½	99	100½
National Containr Corp.	15¾	15⅛	15⅜
Paraffine Companies, Inc.	70½	70½	70½
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	19½	18¾	19
Rayonier, Inc., pf.	38¼	37	37
Ruberoid Co.	38⅞	38⅛	38½
Scott Paper Co.	50½	49	50½
Scott Paper Co., pf.	114¾	114⅜	114⅜
Sutherland Paper Co.	35	34	35
Union Bag & Paper Corp.	17⅜	16¾	17⅛
United Paperboard Co.	7¾	7⅜	7⅜
U. S. Gypsum Co.	94½	91½	91½
U. S. Gypsum Co., pf.	194½	194¼	194¼
West Virginia Pulp & Paper Co.	29	27⅝	29
West Virginia Pulp & Paper Co., pf.	111	111	111

BONDS

Abitibi Pulp & Paper Co. 5s '52	104¼	103⅝	104
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '49	...	...	...
Champion Paper & Fiber Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	107½	107	107½
International Paper Co. 5s '47	104⅜	104½	104½
Mead Corp. 3½s '55	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending June 16, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	41¼	40½	40½
Hummel-Ross Fibre Corp.	9⅞	8¾	9¼
St. Regis Paper Co.	6⅞	6½	6⅝
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	6⅞	6½	6⅞

BONDS

American Writing Paper Co. 6s '61	101½	101	101½

Johns-Manville to Issue Stock

The Johns-Manville Corporation is planning to issue in July $17,000,000 of convertible preferred stock which will be offered to common stockholders and will be underwritten by a group headed by Morgan Stanley & Co.

It is understood that the money will be used to get the company in a position to meet heavy expenditures on expansion after the war.

Puget Sound Votes Dividends

At their meeting held June 8, the board of directors of the Puget Sound Pulp and Timber Company declared dividends payable to stockholders of record June 18, 1945, consisting of the regular quarterly dividend of 30 cents a share on the preferred stock, payable July 1, 1945, and a dividend of 25 cents a share on the common stock payable June 30, 1945.

Masonite Nets 44 Cents

The Masonite Corporation reports for the third quarter of three months ended May 31, 1945, net profits of $321,184, after all charges including income taxes, subject to final audit. This amounts to 47 cents a share on the outstanding common stock of 600,000 shares after providing for preferred dividends. Comparative net profit for the third quarter of the previous fiscal year was $304,918, equal to 44 cents a share on the same basis.

Cumulative profits for the current nine months ended May 31 were $933,764, or $1.36 a share on 600,000 shares of common stock outstanding after preferred dividends. This compares with net profit for the nine months ended May 31, 1944, of $814,637, or $1.16 per share of common stock. Profits for the current nine months, before income taxes, amounted to $2,733,730, out of which provision was made for contingent reserve of $127,000 and income taxes of $1,672,966, including excess profits tax of $894,557. Sales for the current nine months amounted to $12,937,464. The comparable profit before taxes and contingent reserve a year ago was $3,007,715 and sales were $13,236,863.

Stauffer Takes Over Nevada Plant

LAS VEGAS, Nev., June 18, 1945—Stauffer Chemical Company has taken over operation of the chlorine-caustic soda plant which is part of Basic Magnesium, Incorporated. This is one of the largest and most modern chlorine-caustic soda units in the country. It was built in conjunction with the magnesium plant in order to supply it with chlorine. The electric power, necessary for the operation, is being supplied by the hydro-electric station at Boulder Dam, which is within a few miles of the plant location.

With the closing down of the magnesium metal manufacturing unit at Las Vegas, chlorine will continue to be manufactured by Stauffer and shipped to various industries throughout the country, principally to the East for war industries. Caustic soda will be available to consuming industries on the West coast as Las Vegas is but 300 miles from Los Angeles.

May Refund Lake St. John Bonds

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 18, 1945—Possibility of a refunding operation in connection with Lake St. John Power and Paper Company Limited 5½s and 5s is being discussed here in the light of consistently good demand for these issues and the comfortable margin of coverage of interest in recent years.

To Redeem I. P. Co. Bonds

The Bankers Trust Company as trustee, has drawn for redemption on July 1 $96,000 of first and refunding 5% sinking fund mortgage bonds, Series A and B, of the International Paper Company. Payment at 102½ and accrued interest will be made at the Bankers Trust.

More Consolidated Stock Issued

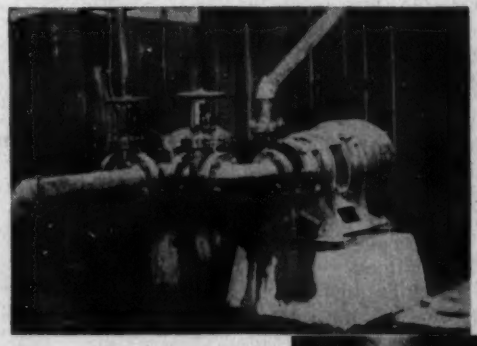
[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 18, 1945—The Consolidated Paper Corporation Limited advises that in the month of May there has been issued in payment of interest 192 shares of the capital stock which makes the present outstanding shares 2,562,931.

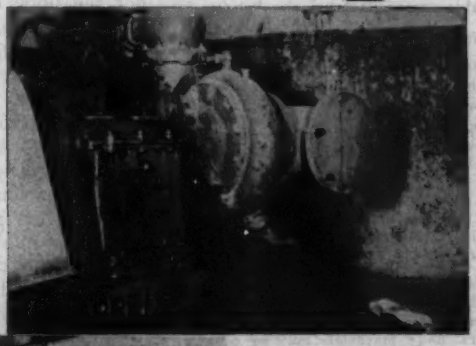
Failure at a Critical Time
IS EMBARRASSING...AND COSTLY TOO!

Southern Advance Bag & Paper Co., Inc., Hodge, La., realized this many years ago and have consistently specialized in bags and wrapping paper of superior quality . . . depending upon WARREN PUMPS for important pumping services in their plants. This progressive mill was one of the earliest in the South to produce their own sulphate pulp for the manufacture of both bags and Kraft wrapping papers. That was back in 1927. Their choice then was Warren Pumps . . . as it is today . . . and their judgment has been vindicated many times. It is just such on-the-job records that make Warren Pumps preferred by Paper, Pulp and Board Mills the country over.

FOR EVERY PULP AND PAPER MILL SERVICE, SPECIFY DEPENDABLE WARREN PUMPS



Mill Water Supply—6000 GPM —105 ft. head (equivalent to water supply required by a city of approximately 86,000 population)



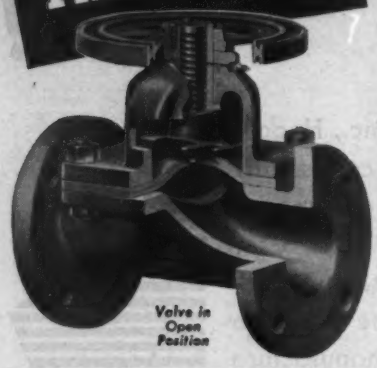
Stock Pumps in No. 1 Machine Room Basement.

Wash-up Pumps in No. 1 Machine Room Basement.

WARREN PUMPS

WARREN STEAM PUMP CO., INC.
WARREN, MASSACHUSETTS

with
This Valve..



Valve in Open Position

YOU END CLOGGING of Bonnets and Corrosion of Bonnet Parts in Stock Lines

■ A tough resilient diaphragm of rubber or synthetic completely *isolates* the bonnet and its working parts from the body. It is impossible for stock to clog the bonnet or corrode the working parts. There is no chance of contamination of your product by accumulations of lubricant or other undesirable materials from the bonnet.

- *Closure* is drip tight.
- *Repair* is easy, rapid and cheap. Removal of bonnet makes it easy to get at interior of the valve.
- *Headroom requirement is low*—as much as 25% less than that required by other types.
- *Flow characteristics* at full open are close to those of gates and plug cocks, yet the valve lends itself admirably to *throttling*.
- *Available* in handwheel, lever operated and sliding stem types — the last named can easily be attached to standard operators. Body materials may be of any machinable alloy or cast iron, plain, galvanized, or lined with glass, lead, rubber, lacquer, paints, etc.
- *Size Range* ½ to 14" makes this valve available for practically every pulp and paper mill service where pressure does not exceed a maximum of 150 psi. (small sizes) down to 30 psi. for large valves and where temperatures (depending on service) do not exceed 200° F. Write for Catalog V-44. HILLS-McCANNA CO., 2447 West Nelson Street, Chicago 18, Illinois.

Valve in Closed Position

HILLS-McCANNA
SAUNDERS PATENT
Diaphragm VALVES
Proportioning Pumps — Force-Feed Lubricators — Chemical Valves — Air & Water Valves — Marine Valves — Magnesium Alloy Castings

Seek Larger Deliveries

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 13—The raising of print paper delivery quotas of magazine publishers and commercial printers to the level of previous permitted use was recommended to the War Production Board by the Magazine and Periodical Industry Advisory Committee and the Commercial Printing Industry Advisory Committees at recent meetings in Washington. In view of current paper shortages, second quarter restrictions limit the acceptance of new print paper deliveries generally from 13 per cent to 15 per cent below the average 1944 quarterly consumption, WPB Printing and Publishing officials said.

If WPB adopts the committee's recommendations, Limitation Orders L-244, covering magazines, and L-241, covering commercial printing, will be amended to permit magazine publishers and commercial printers to accept delivery of new print paper in the third quarter in quantities equal to their full, lawfully permitted consumption in that quarter, it was pointed out.

A similar plan of equalizing delivery quotas with consumption quotas, adapted for the specific needs of the book publishing industry under the book order L-245, was recommended by the Book Publishing and Manufacturing Industry Advisory Committee at its meeting on June 5, 1945.

The proposed changes would not in any way relax present limitations on paper consumption although they would represent relief from the more rigid delivery restrictions effective in the second quarter. The recommendations of the three committees were based on the belief that the amount of paper available to these industries in the third quarter will be slightly greater than in the second quarter largely because of expected cutbacks in the Army requirements for nitrating pulp. Possible shipments of pulp from Sweden in the future were not taken into consideration by the committees, since likelihood that such shipments will effect any substantial relief in the third quarter seems remote at the present time, it was explained.

In the interest of full employment in the printing and publishing industries, the committees also recommended that relaxation of the use restrictions of Orders L-244, L-241 and L-245 be carefully timed to coincide immediately with any increased supply of paper that might become available. Existing task groups of the industries were authorized to continue their studies of developments in the paper supply situation and empowered to make specified recommendations for relaxation of the printing orders when and as conditions change.

Seek Better Transport

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 11, 1945—Failure to exceed 1944 levels of pulpwood production for heavily increased military requirements of pulp and paper products is of grave and national concern, members of the Eastern Pulpwood Industry Advisory Committee were told at their recent meeting. Over-all pulpwood receipts for the first four months of 1945 were five per cent less, domestic receipts four per cent less and imports of pulpwood 9 per cent less than during the like period in 1944, the War Production Board reported.

Officials said they expected pulpwood receipts to increase as the tight labor and equipment situations ease during coming months. However, they added, every effort must be expended now to stimulate increased pulpwood production by farmers, wood cutters, industry and government alike.

Railroad cars have been in short supply for some months, and the movement of wood by rail is a prime factor limiting the movement of pulpwood to the mills today. This shortage of railroad cars and adverse weather conditions were said to have contributed greatly to lower pulpwood receipts in recent months. An increasing shortage of cars for the movement of pulpwood can be expected during the remainder of 1945. The transportation shortage is caused by the tremendous requirements of the armed services to move men and material westward for the prosecution of the war against Japan WPB spokesman said.

The planned acceleration of civilian truck and tire production in the third and fourth quarter of this year is expected to ease truck transport problems for the pulpwood industry, they added.

It was the consensus of this committee and Government spokesmen that additional and most strenuous efforts must be made to attract free labor into vital woods work as war production plant cutbacks make an increasing amount of such labor generally available. Intensification of such a campaign is of highest urgency, WPB said.

60 years' experience in making
ADHESIVES THAT WORK

"It is a pleasure to deal with a company that is cooperative and dependable"

ON the adhesives for the folding paper boxes here illustrated—manufactured by the Empire Box Corporation of Garfield, New Jersey—Mr. S. L. Neidorf, Treasurer, writes:

"We have been a satisfied Arabol customer for more than twenty years. It's a pleasure to deal with a company that is so cooperative and dependable—particularly in these days. We like your service, the way you handle our problems, and the way your adhesives provide a minimum of waste while giving us a maximum of efficient operation. In your sixtieth year, we would like to take this opportunity to wish you the continued success you deserve."

The Folding Box Glue used by Empire Box Corporation is a clean operating adhesive. It is odorless, gives good mileage and works particularly well on Staude machines. Other Arabol Folding Box Adhesives with equally high workability and economy are expressly made for International Machines.

Why not investigate the benefits from Arabol Adhesives and service? Test them at our expense. See the Arabol Representative when he calls. He knows adhesives.

THE ARABOL MANUFACTURING CO.

Executive Offices: **110 East 42nd St., New York 17, N. Y.**

CHICAGO—54th Ave. & 18th Street • SAN FRANCISCO—30 Sterling Street

Branches in Principal Cities • Factories in Brooklyn, Cicero, San Francisco

Adhesives? . . . ARABOL!

SIXTY YEARS OF PIONEERING

Obituary

Wifred L. Howe

Wilfred L. Howe, salesman in the Boston territory for Hurlbert & Hatfield, paper dealers, with whom he had been associated for 23 years, died recently of a cerebral haemorrhage. He was taken ill suddenly on Thursday and died the following Sunday. He was well and favorably known in the trade. Mr. Howe was a member of the American Legion, the Massachusetts State Guard and was a Mason. A wife and two daughters, Misses Priscilla and Charlotte Howe, all of Sharon, Mass. and two brothers, F. B. Howe, New England representative of the Southern Advance Bag and Paper Company, Inc., and Arthur R. Howe, of the Ludlow Manufacturing and Sales Company, are living.

Mrs. Ella S. Kiely

Mrs. Ella (Smith) Kiely, 80, wife of Thomas H. Kiely, died on June 11th at her home, 70 Munroe Street, Northampton, Mass., after a long illness. She was the daughter of Ellen (Shannon) Smith and was a lifelong resident of Northampton. She leaves two sons, James B. and William H. Kiely of Northampton, and two daughters, Mrs. Mary Crosby of Springfield and Miss Helen U. Kiely Chief Chemist of the American Writing Paper Corporation. The funeral was at home on June 14, followed by a solemn requiem high mass at St. Mary's Church. Burial was in St. Mary's Cemetery.

Victor S. Bennett

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 18, 1945—News has been received here of the death in Newfoundland, on June 3, of Victor Sydney Bennett, a pioneer in the field of air mail service and well known throughout financial pulp and paper and aviation circles in Eastern Canada, as well as in Newfoundland. He was in his 48th year, and was a son of Sir John Bennett.

Mr. Bennett served in the Royal Air Force in the Great War and won the Croix de Guerre with palms. He was closely associated with the first successful attempt by Alcock and Brown to fly the Atlantic.

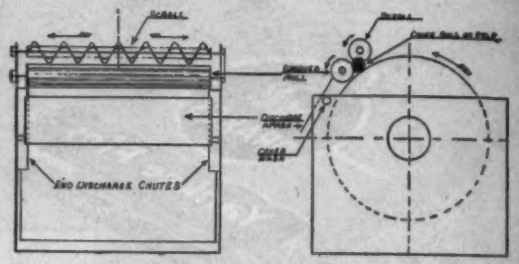
He is survived by his wife, the former Winefride Redmond Browne, of London, England; one son; two daughters; a sister, Mrs. J. M. Keddie of Montreal; and two brothers, Dr. Raymond Bennett and Frank Bennett.

International Grants Wage Increase

GLENS FALLS, N. Y., June 16, 1945—A general wage increase of three cents an hour to all employes of the International Paper Company was granted at a recent conference between officials of the company and representatives of the International Brotherhood of Papermakers. Among the branch plants included in the agreement are the Hudson River Mill, Palmer, N. Y.; Otis Division, Chisholm, Me.; Tonawanda Mill, North Tonawanda, N. Y.; Ticonderoga Mill and the York Haven Mill, York Haven, Pa. Several hundred employes are affected by the general increase. The agreement calls for three holidays each year with pay — Christmas, July 4th and Labor Day. The increase in the hourly wage scale and the observance of the three days became effective on June 1 under the pact.

Oliver Perfects Washer, Discharger

The Oliver ringvalve pulp filter, introduced about six years ago as a brown stock washer and decker, has been further developed so that it offers many advantages when used also as a bleach washer, wasner thickener, and high density thickener. The basic and



OLIVER-DENHARD DISCHARGER FOR GROUNDWOOD DECKER AND SAVEALLS

exclusive feature of the filter is the centrally located valve which provides short liquor travel, quick removal of liquor from sections, exceptionally uniform sheet, high washing efficiency and chemical recovery with high capacity. When used as a brown stock washer, the ringvalve permits sharper separation of strong and weak liquor, thus improving operation and reducing the load on the evaporators.

Another Oliver United development is the Oliver-Denhard (O-D) discharger, designed especially to discharge sheets that are characteristically thin or weak. The discharger consists of a rubber covered pick-up roll which revolves with positive clearance to roll up the sheet much as one rolls up a snowball on the ground except the mass is cylindrical instead of spherical. This rolled up sheet is removed continuously by screw conveyor to chutes at each end of the vat. The consistency of the discharged sheet is exceptionally high for decker operations. Positive clearance protects the wire; nothing touches the wire except the sheet itself.

New Belt Hooks

The Bristol Company, Mill Supply Division, Waterbury 91, Conn., recently announced the addition of a line of hinged-type wire belt hooks, known as Bristol's belt hooks, to its line of belt lacing products. The new hooks are designed for joining all types of flat belting, including leather, fabric, rubber, and balata belts. Various sizes are offered to take care of belts up to 3/8 inches thick.

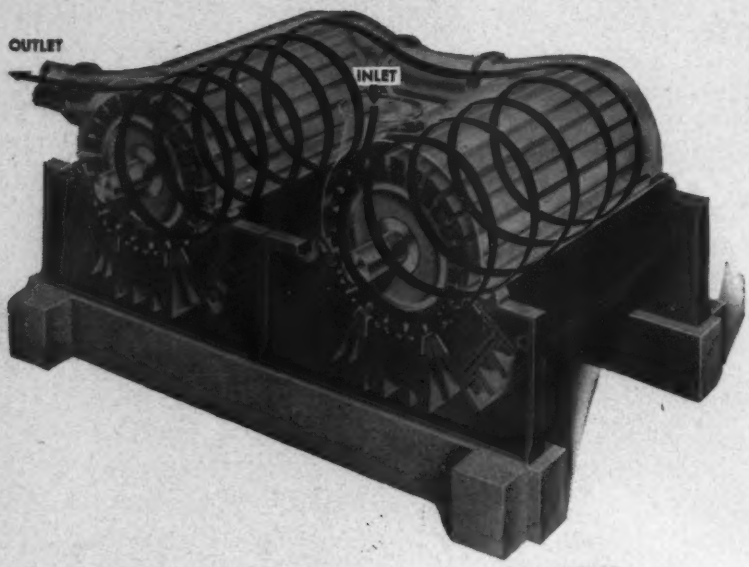
A new method of mounting the hooks in the spacer card makes it possible to leave the card in place in the lacing machine during the lacing operation. The hooks are thus held in accurate alignment until the hook points pierce the belt. It is not until after the lacing operation has been completed that the card is removed. This method of carding insures a uniform spacing of the hooks and results in an even distribution of pull over the width of the belt.

The hooks are designed in such a way as to enter the belt in two rows with each opposite point passing into the belt in alternate rows. The purpose of this arrangement is to eliminate interference between opposite hook points as they are pressed into place and also to distribute the grip on the end of the belt over a greater area.

The new belt hooks are described in Bristol's Bulletin No. 737.

for dependability

GENERAL DYESTUFF CORPORATION

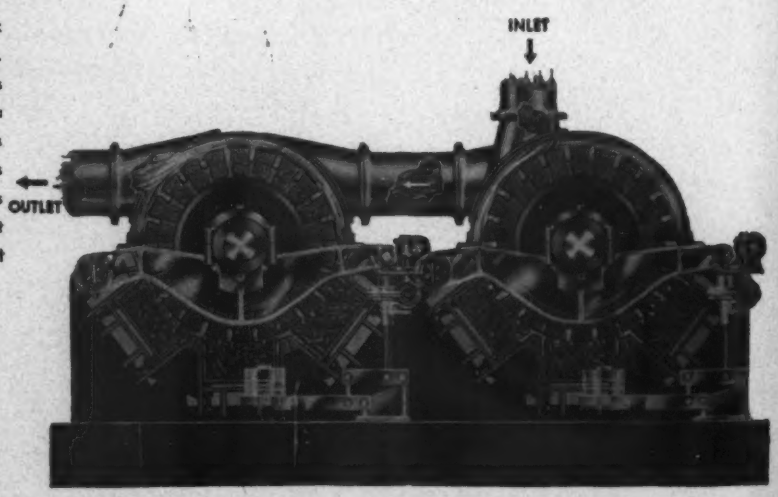


SMITH-EGAN BEATER

for continuous or batch beating

Units furnished for either continuous or batch beating . . . Rapid circulation with highly efficient treatment . . . Flexible to meet the needs of a wide scope of conditions . . . Designed so that all stock is treated uniformly . . . Desired roll setting, once determined, can be repeated at any time . . . Permits control and variation of hydrating effect . . . Provides high tear value of any given Mullen . . . Eliminates unnecessary circulation therefore uses low h.p. per ton . . . Handles large capacities efficiently up to 6% density . . . Saves considerable floor space . . . Minimum contact and friction of beater parts . . . Operates for considerable periods of time without attention . . . Continuous Beater supplied in two or more units (rolls) in series . . . Each roll can be controlled independently.

Smith-Egan continuous two-unit beater. The stock is carried from the inlet directly to the bedplates. The pressure of the stock (head and back) tends to drive the stock under and across the roll in a spiral fashion, with the result that the stock passes between bedplates and roll a number of times before reaching the outlet of the chamber. This same action is repeated in each subsequent chamber until the stock reaches the final outlet and flows to the chest.



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PAPER and INDUSTRIAL APPLIANCES, INC.
122 EAST 42nd STREET NEW YORK, N. Y.

ONLY STERILE PAPER *Protects food all the way*

Paper and paperboard containers carry much of the responsibility for protecting food all the way from producer to consumer. Don't let your paper be a source of contamination.

Food container paper to fulfill this responsibility must not only be free from disease producing organisms, but from so-called "harmless" bacteria that impart unpleasant odors and tastes, or cause actual spoilage.

You can make certain that your paper meets such bacteria-free requirements by employing the W&T Chloramine Process for sterilization. Wallace & Tiernan Engineers, from long years of experience in the paper field, will recommend the method of application best adapted to your particular production processes.

P-46

WALLACE & TIERNAN COMPANY, INC.

Manufacturers of Chlorine and Ammonia Control Apparatus
Newark 1, New Jersey
Represented in Principal Cities

Announces Newsprint Supply

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 20, 1945—Approximately 38,500 tons of newsprint could be added to third-quarter consumption quotas of publishers by relaxation of newsprint Limitation Order L-240, which was recommended by the Newspaper Industry Advisory Committee, the War Production Board said today. The order, controlling newsprints consumption, was issued January 1, 1943. Prospective increased shipments from Canada and decreased diversions of newsprint to European areas, resulting from Scandinavian production, were noted by the committee when it recommended relaxation recently at a two-day meeting, WPB said.

The committee proposed that the sliding scale of reductions applicable to the quarterly adjusted base tonnages be amended, effective July 1, as follows: Deduct three per cent of the amount over 25 tons, but not over 125 tons; deduct six per cent of the amount over 125 tons, but not over 250 tons; deduct nine per cent of the amount over 250 tons, but not over 500 tons; deduct 15 per cent of the amount over 500 tons, but not over 1,000 tons; deduct 18 per cent of the amount over 1,000 tons. The committee also recommended that all deferred orders held by mills on June 30, 1945, be frozen for the third quarter of 1945.

Total third-quarter newsprint supply will be 884,000 tons, consisting of 660,000 tons from Canada, 184,000 tons from the United States and 40,000 tons from Newfoundland, WPB representatives said. The third-quarter requirements, including tonnage required for the proposed relaxation of the order, will be 890,000 tons, so that only by strict adherence to the delivery and inventory restrictions and the elimination of over-orders on newsprint mills will the proposed relaxation be possible.

Monthly delivery quotas will be one-sixth of the total of a publisher's consumption quotas for the third and fourth quarters of 1945, WPB said.

Canadian Plants Improve Facilities

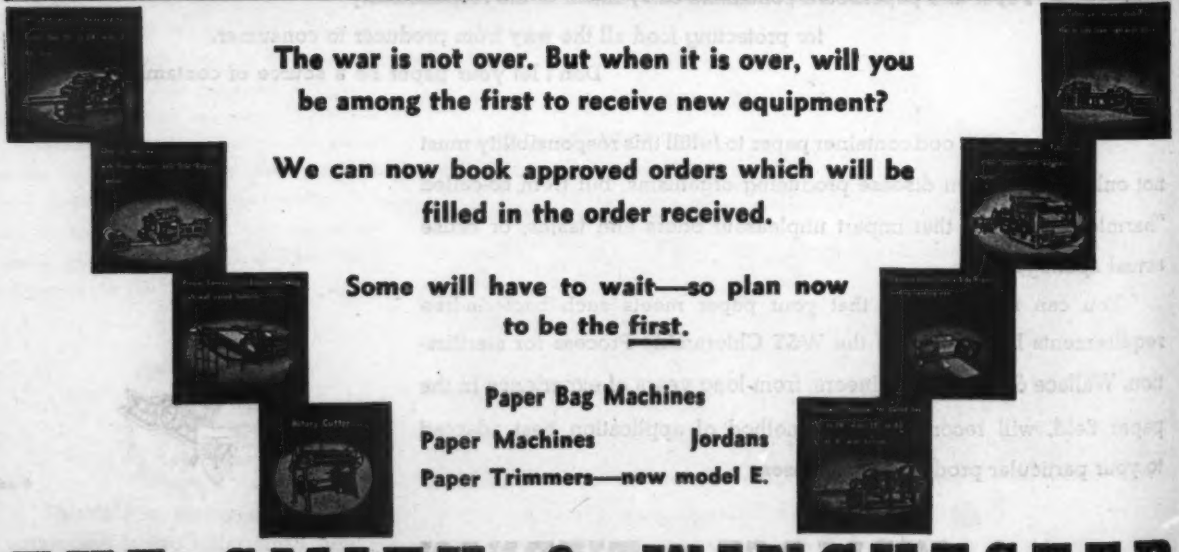
[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 18, 1945—Among the more important plant improvements now under way, it is announced that the Canadian International Paper Company has started with its own working force on a $90,000 job of alteration and improvement of facilities at its Gatineau plant, where it has a large ground wood and sulphite pulp mill, and an interest in the paperboard plant of the Canadian Masonite Corporation. An approximately similar amount is being spent this summer on extensions and improvements to the Brompton Pulp and Paper Company's plant at Bromptonville, Que., which has a present capacity of 275,000 lbs. of newsprint per 24 hours and 300,000 lbs. of ground wood. The big newsprint plant of the North Shore Paper Company at Baie Comeau, Que., already one of the most modern in Canada, is being further modernized at a cost of half a million dollars. The present capacity is 840,000 lbs. of newsprint per 24 hours.

Bengtsson Resigns from Van Reekum

NEW YORK CITY, June 18, 1945—H. G. Bengtsson late last week resigned as executive vice-president and director of the Van Reekum Paper Company. His future activities will be announced at a later date.

SINCE 1828 — CONTINUOUSLY WE HAVE SERVED THE PAPER INDUSTRY.


The war is not over. But when it is over, will you be among the first to receive new equipment?
We can now book approved orders which will be filled in the order received.
Some will have to wait—so plan now to be the first.
Paper Bag Machines
Paper Machines
Jordans
Paper Trimmers—new model E.

THE SMITH & WINCHESTER
MANUFACTURING COMPANY
PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Inc.

220 East 42nd Street
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27th YEAR

Raymond L. Barton, President,
Michigan Paper Company
Plainwell, Michigan

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Ollie W. Messner, 3rd Vice-Pres.,
Robertson Paper Box Co., Inc.
Montville, Conn.

Charles H. Reese, 4th Vice-Pres.,
Nekoosa-Edwards Paper Co.,
Port Edwards, Wis.

James Fish, 5th Vice-Pres.,
Paterson Parchment Paper Co.,
Bristol, Pa.

George W. Craigie, Secy.-Treas.
220 East 42nd Street
New York 17, N. Y.

Rules on Swedish Pulp Prices

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 20, 1945—Existing producer ceiling prices for domestic and Canadian wood pulp sold in the United States will apply to Swedish and other Scandinavian wood pulp when such imports are resumed, the Office of Price Administration announced today, in Amendment 4 to RMPR No. 114 —Wood Pulp.

One adjustment in today's action, effective June 14, 1945, permits Scandinavian wood pulp shippers to pass on part of North American inland freight costs when such costs exceed specified limits. Similar limits apply to Canadian and United States producers.

In thus putting Scandinavian wood pulp on a comparable basis with domestic and Canadian wood pulp, OPA gave its answer to many inquiries during recent weeks as to the ceiling prices of Swedish wood pulp when shipments are resumed to the U. S. market. Expectations are that the first of such shipments will be made in the near future.

In arriving at its decision, OPA consulted with American buyers of wood pulp, representatives of Swedish wood pulp manufacturers, importers, OPA's Wood Pulp Industry Advisory Committee and with other Government agencies.

All ocean transportation costs will be paid by the sellers of Scandinavian wood pulp. OPA said that it is cooperating with other U. S. Government agencies, as well as Swedish producers, to obtain reasonable ocean freight rates for wood pulp.

Explaining the inland transportation allowances for Scandinavian wood pulp, OPA said that when the actual North American inland freight cost per short air dry ton, after loading on the inland carrier, exceeds $7 for wood pulp over 80% air dry, or exceeds $9 for wood pulp 50 to 80% air dry, the excess may be added to the applicable ceiling price.

In the main, no excess transportation costs will be passed on to consuming mills when deliveries are made east of Chicago. Mills west of Chicago may be required to absorb a small portion of the inland freight as long as distant all-rail hauls continue from the eastern seaboard. However, OPA pointed out, when normal water traffic on the Great Lakes is resumed, only in exceptional cases will any U. S. buyers be required to absorb a part of the freight costs.

Hufford Retires from WPB

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 13, 1945—The War Production Board today announced the appointment of W. C. Glynn as transportation consultant, assisting Benton R. Cancell, director of WPB's Forest Products Bureau. Mr. Glynn will handle all transportation problems for the containers, paper, paperboard, printing and publishing, and the lumber and lumber products divisions. Mr. Glynn has been transportation consultant for the containers division since December 1942, and prior to that time was assistant freight manager for the Pennsylvania Railroad in his home city, Philadelphia, Pa.

WPB also announced the resignation of Franklin E. Hufford, transportation consultant for the paper and paperboard divisions of the Office of Production Management and WPB since November 1941. Mr. Hufford, who has performed an outstanding job for the War Production Board, has accepted a position with the Minnesota and Ontario Paper Company.

TRADE MARK

Trinity Bag & Paper Co., Inc.

25 WEST 43rd STREET • NEW YORK 18, N. Y.

Mill Agents and Distributors

PAPER BAGS AND SACKS
All Types and Styles
Self-Opening, Square
Flat and Sacks

WRAPPING PAPERS
Kraft—Bleached and Unbleached
Butchers—Dry and Water Finish
M. G. Papers—Bleached and Unbleached

WRITINGS
Bonds and Ledgers
Index

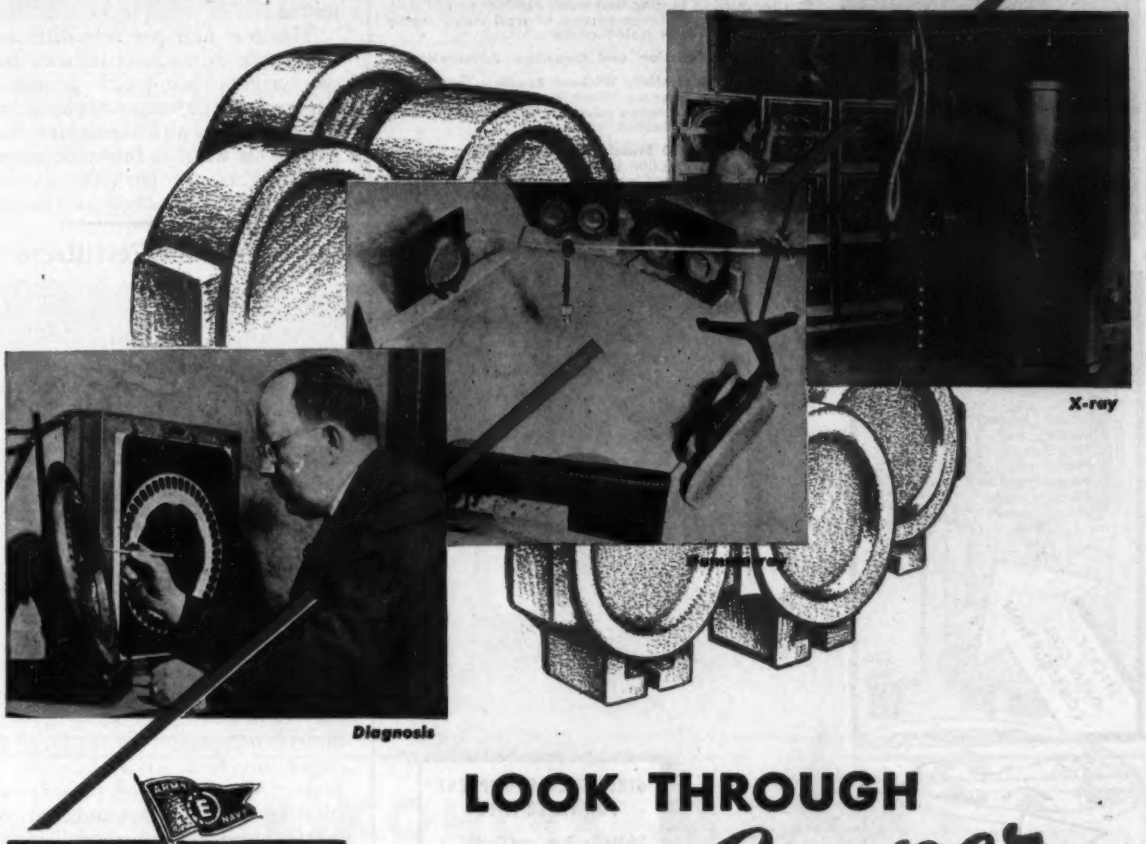
OTHER GRADES
Envelope, Offset and Printing
Gumming—Bleached and Unbleached
Kraft Specialties of all Descriptions — both Bleached and Unbleached

Agents for:

FLORIDA PULP & PAPER CO., PENSACOLA, FLA. • SANTA ROSA PULP & PAPER CO., PENSACOLA, FLA.

BAG PLANTS AT MOBILE, ALABAMA, AND MONROE, LA.

THREE KINDS OF "EYES"



X-ray

Diagnosis

LOOK THROUGH *Cooper* STAINLESS CASTINGS

At the Cooper Alloy Foundry we use three kinds of "eyes" to check the soundness of castings. We use three because all three are necessary to do a thorough, economical job — for your complete assurance. These "eyes" are: X-rays and Gamma-rays plus expert human eyes that are trained to interpret the results of radiographic pictures.

You can get the benefits of the most modern equipment plus skilled use of such equipment by specifying Cooper Stainless Castings — Radiographed by Cooper.

THE COOPER ALLOY FOUNDRY CO.
170 BLOY ST., HILLSIDE, N. J.

THE ONLY ALLOY FOUNDRY WITH ALL THESE FACILITIES

- Laboratory control over raw materials and finished products.
- Dual foundry . . . both hand and machine molding.
- Electric arc and high-frequency-induction melting furnaces.
- Centrifugally-cast castings.
- Heat treating of Castings up to six feet.
- X-ray and Gamma-ray inspection.
- Zyglo detection of surface imperfections.
- Precision Castings.
- Machine shop . . . specially equipped for finishing stainless steel.
- Improved cleaning . . . including Lustracast electrolytic finishing which leaves all surfaces bright.
- Castings furnished rough, polished or fully machined . . . one ounce to two tons.
- Development of special alloys to meet unusual requirements.
- Technical consulting service.

THE *Cooper* ALLOY FOUNDRY CO.

STAINLESS • MONEL • NICKEL

STICKLE
OPEN COIL
FEED WATER
HEATERS
AND
PURIFIERS

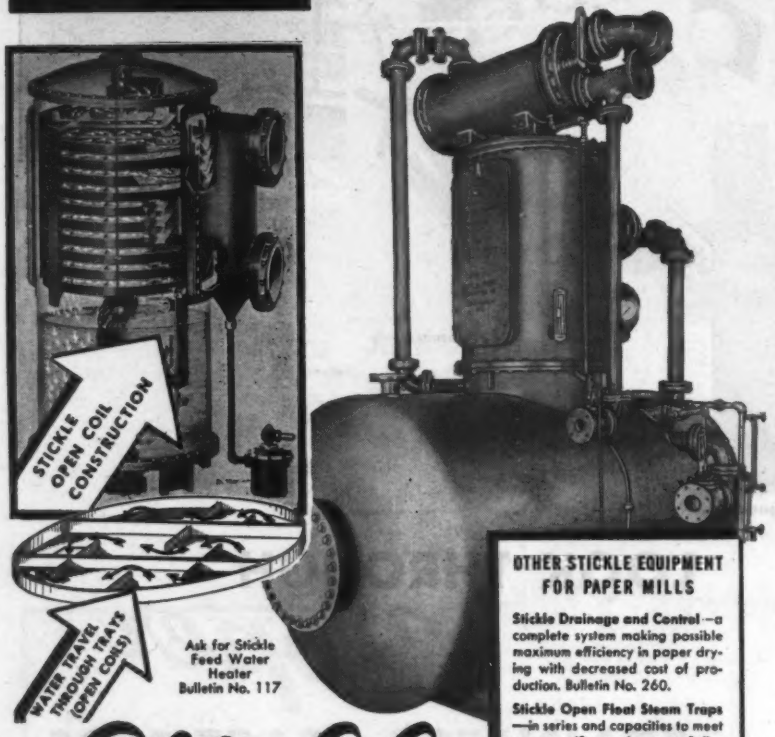
1 **Heat Water to Higher Temperature in Less Space.** Bring water into direct contact with steam. Instantaneous transmission of heat from steam to water. Delivers feed water to pump within two degrees of temperature of saturated steam in heater.

2 **Supply Better Quality of Feed Water.** All steam condensed in heating feed water becomes part of boiler feed supply. Large portion of total boiler supply absolutely free of scale-forming substance.

3 **Control Admission and Overflow Automatically.**

4 **Perform Indefinitely Without Repairs.** Trays easily removed for cleaning. Water does not overflow sides of trays. Scale-forming substance does not accumulate on side-walls of heaters.

5 **Available in 10 Standard Sizes in Single Heaters,** capacity range, 3,000 lbs. to 130,000 lbs. Dual Heaters in six standard sizes, capacity range, 30,000 lbs. to 250,000 lbs. Deaerating and non-deaerating types.



Ask for Stickle Feed Water Heater Bulletin No. 117

OTHER STICKLE EQUIPMENT FOR PAPER MILLS

Stickle Drainage and Control—a complete system making possible maximum efficiency in paper drying with decreased cost of production. Bulletin No. 260.

Stickle Open Float Steam Traps—in series and capacities to meet your specific requirements. Bulletins Nos. 115, 315 and 415.

Stickle Reducing and Regulating Valves—especially designed for rigid paper mill accuracy, sensitivity and dependability requirements. Bulletins Nos. 235 and 435.

Stickle

STEAM SPECIALTIES COMPANY

2215 VALLEY AVENUE • INDIANAPOLIS, INDIANA

Contemplate Lighter Paper

WASHINGTON, D. C., June 13—Specific price additions allowed manufacturers on light weights of book papers have been extended to include a further addition for still thinner paper that may be made because of the scarcity of pulp, the Office of Price Administration announced. In the event that thinner paper is produced than is covered by the light weights for which price additions of 1½ per cent, two per cent and three per cent already are allowed, manufacturers may add four per cent additional, effective June 18, 1945. These additions are made to the ceilings for standard weight book papers, and are allowed to compensate manufacturers for additional costs of producing thinner papers.

Heretofore, where no specific price addition was provided for light weight papers, manufacturers were allowed to add the customary addition they had in effect during the October 1, 1941, to March 31, 1942, base period. Today's action makes the addition uniform on new light weights for all manufacturers whether or not they produced the light weights in the base period. The action was recommended by the Book Paper Industry Advisory Committee.

The new four per cent differential will apply to machine finished paper on weights below 25 pounds, to supercalendered paper on weights below 30 pounds and to machine coated papers on weights below 35 pounds. All weights are per 500 sheets of paper measuring 25 by 38 inches.

Lignin for Fertilizers

The use of lignin for fertilizers will be discussed at a meeting of the Northeastern Wood Utilization Council to be held in Orono, Maine on June 29. Participants will include leaders of industry, forestry, agriculture and research.

Lignin has been classed as the largest waste in industry, pulp and paper mills alone discharging 2,000,000 tons of it annually. Sawmills and other wood working plants scattered throughout the nation can make readily available another 10,000,000 tons of wood waste, while forest and agricultural wastes have many times that amount potentially available.

The use of lignin for fertilizers may rank among the most important outlets, on account of the large tonnages involved. For example the present day output of the expanded plastics industry amounts to only 400,000 tons, or just a small fraction of the total available lignin. In comparison, the fertilizer industry produced over 11,500,000 tons in 1944 and even larger tonnages will be called for in the future.

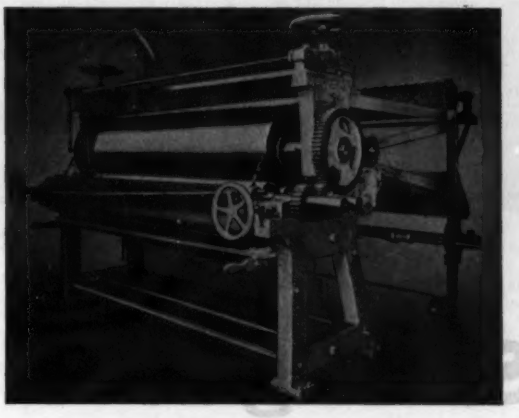
Lignin is of special importance to sandy soils, as a supplier of humus and organic matter. For example states such as Maine, New Jersey and California, as well as potato growing areas throughout the nation would be directly benefited. The Northeastern Wood Utilization Council is a private non-profit organization doing research on new uses for wood and wood waste in the Northeast and helping to translate this research into local industries.

Among the papers scheduled are "Wood Ashes for Fertilizer," "Sawdust Bedding with Superphosphate Treatment," "Action of Soil Bacteria on Wood Products" and "The Use of Lignin as a Sulphur Bearing Material." Other technical papers include "Cost of Drying Lignin from Sulphite Mills," "Impregnation of Nitrates and Phosphates" and other reports on research projects in this field.

Synchroset Machine Gives Fine Coating

A new "Synchroset" coating machine made by the John Waldron Corporation, New Brunswick, N. J., is a specially designed rotogravure offset printer for installation in a paper machine group, or in relation to a Yankee drier. It is rugged, free of delicate adjustment mechanisms, and capable of being washed down with a hose. In other words, the equipment is comparable to papermill machinery, and yet the control of the machine is of such a character that fine coatings may be precision-metered to the surface of the paper, either on one or both sides. This machine will handle book, litho, magazine, newsprint and paperboard.

After the web of paper has been formed and partly dried, it is led to a special calender that levels off the web; the paper web then passes to the "Synchroset" where, dependent upon the design of the machine, it is coated on either one side and then on the other, or on the same side with two or more applications, or on both sides simultaneously. Drying is simplified by the high percentage of solids in the coating as used by the "Synchroset" method.



THE WALDRON SYNCHROSET

The "Synchroset" coater includes a long-life specially engraved roll capable of applying 6 to 7 pounds of coating to a ream 25 x 38 - 500. A resilient furnish roll feeds the coating material from a pan to the engraved roll. The resilient furnish roll rotates at a relatively low speed even when the web of paper may be passing through the machine at 600, 800 or 1000 f.p.m.

A large diameter resilient offset roll receives the coating from the engraved roll and transfers it to the face of the paper web; this distributes the coating onto the transfer roll in a printed "Synchroset" pattern which is maintained to the nip through which the web passes; as the web goes through the nip between the resilient offset roll and a large diameter backing roll, the face of the web is pressed to the face of the offset coating roll. The interaction of the "Synchroset" resilient offset roll and the backing roll serves to merge the printed "Synchroset" pattern of the coating material onto the face of the web in a uniform film.

The machine is so designed that, in the event of a paper break, automatic controls relieve the engraved print roll and backing roll from contact with surface of the resilient offset roll and paper web.

Individually controllable pressures permit proper alignment which is so necessary on paper machines where the web is wide.

THE KOHLER SYSTEM
OF
CONTINUOUS UNWINDING CONTINUOUS WINDING

Magazine reels,—electrically rotated roll stands—are used for both operations. Cores are chucked in the machines without spindle shafts. Loading and unloading are carried on while the process is running. Electric sidelay control is a standard feature.

Surface controlled unwind tension holds uniform throughout each roll, and roll after roll.

The "Flying Paster" changes rolls at full speed.

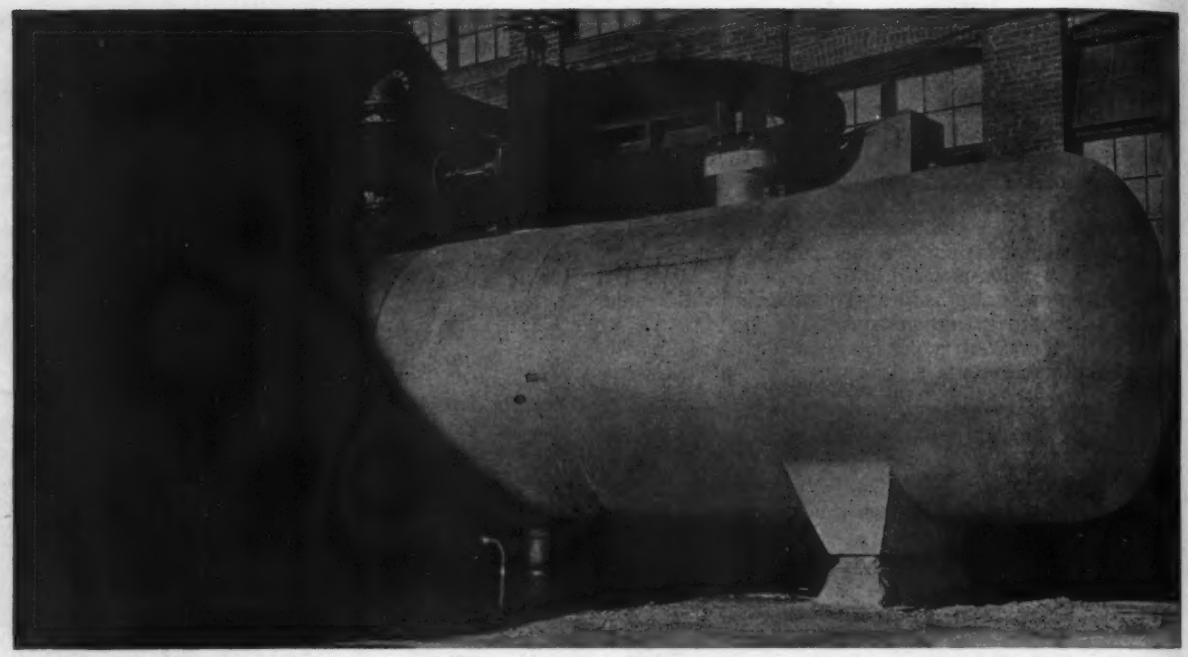
Center driven winding with constant tension drive provides perfect rolls without wrinkles or cuts.

The winding roll changer strikes in new cores at full speed.

The two units in combination change batch finishing operations to continuous processes, giving

INCREASED PRODUCTION DECREASED WASTE
CONSTANT UNIFORM QUALITY OF PRODUCT

THE KOHLER SYSTEM COMPANY 159 EAST CHICAGO AVENUE CHICAGO 11, ILLINOIS



This large Ruths steam accumulator of 2,000 cu. ft. volume has been in successful operation for ten years in a textile mill.

Steam Storage *Saves* $46,500. Annually

● Operating records of a large sugar refinery show that after a year's operation with a Ruths steam accumulator, not only was the plant fuel costs reduced $46,500, but in addition, a 15% saving was made on steam consumption of the sugar pans.

● This typical case history highlights the advantages of steam storage accruing to industrial plants with fluctuating steam demands. Steam is stored during periods of minimum steam requirements and delivered when peak demands occur; this permits boilers to operate efficiently at a fixed rating with steam available in required quantities and at desired pressures to meet the widely varying process needs and reduces boiler and furnace maintenance.

● Steam storage, always a possible factor for increasing plant efficiency, is particularly important today as it reduces fuel consumption and decreases operating difficulties on already overworked steaming units.

FOSTER WHEELER CORPORATION, 165 BROADWAY, NEW YORK 6, N. Y.

FOSTER FW WHEELER

STARCH is at War*

* in PAPER used to plan the attack

U. S. Navy Photo

— a U. S. Navy photo records the damage to a Jap Pacific air base. Reconnaissance photos provided detailed installation data. And objective maps, prepared by skilled photo-interpreters, selected the targets for pin-point bombing. Photographic paper and special paper necessary for accurate speed reproduction of military charts and maps use *substantial quantities of starch!*

* in TEXTILES used to make the attack

U. S. Army Photo

Snow capes, like camouflage cloth, increase the effectiveness of a soldier in battle. And like barrage balloon cloth, cotton duck, tent twill, surgical gauze, parachute cloth for flares — they're made of single yarn fabric. None could be woven *without the use of large quantities of starch* as warp size.

DO YOU KNOW? that starch products are also used in signal flares, colored smoke grenades and sky markers to control the burning rate . . . in batteries as a carrier for the electrolytic agent . . . in field rations as a basic food item in the diet of our fighting men . . . in drugs and medicines to facilitate tableting, to standardize dosage, to increase the rate of dispersion . . . in aluminum to hasten settling and filtration of the crude sodium aluminate solution . . . in boiler treating compounds for especial Navy use.

Remember this — if you're unable to obtain starch products to meet your civilian requirements — *starch is at war in hundreds of ways!* Our first responsibility is to formulate and produce starch products for vital war applications. National is proud of the high trust placed in its research, service and production facilities by our armed forces.

Specific war application information is available — NOW! Address: National Starch Products, 270 Madison Avenue, New York 16; Boston, Philadelphia, Chicago, Indianapolis, San Francisco and other principal cities. In Canada: Meredith, Simmons & Co., Ltd., Toronto and Montreal.

National STARCH PRODUCTS

STARCHES — AND SPECIALTIES WITH EASILY DEMONSTRATED SUPERIORITY

Indianapolis Demand Heavy

INDIANAPOLIS, Ind., June 11, 1945 —Wholesale demand for paper continues unabated last week with supplies tight and jobbers unable to fill orders. In spite of cutbacks in war production in this and other areas of the state, the paper demand from war industries thus far has not been affected, but if the time comes that there is less demand from this source, it will be absorbed immediately by that from strictly civilian sources.

Due to the lateness of spring, demand for paper specialties has been somewhat lagging, but the last week saw a definite improvement and jobbers are finding their stocks dwindling. Paper cups, napkins, towels and other items are now moving rapidly. Also with the coming of really warm weather, demand from the ice cream and dairy industry has jumped decidedly.

Curtailment of beer production this summer has eased the demand somewhat for heavy cardboard beer cases and demand for containers from the liquor industry also is below that of last year, but the decrease hardly has been noticed by the trade, due to heavy demand from other users of heavy board. The demand for building paper and roofing, while not high, is considerably improved this year over last, due to government permission for construction of smaller types of houses.

Newsprint demand continued up to quotas and the publishers are looking forward to the day when their tonnage can be upped somewhat. Advertising continued to be turned away because of space restrictions. Fine paper demand continued heavy with wholesale stocks strictly limited. Tissues were moving heavily with shortages reported in many items.

Waste paper collections continued in fair volume with local warehouses reporting heavy mill demand for virtually all grades. All prices were at ceiling levels. Rag demand also was active, praticularly for better grades and prices at ceiling levels.

Capital Paper Co. to Move

The Capital Paper Company, manufacturing and wholesale paper, and its subsidiaries soon will move into a new home at 1201 West Washington. The new plant covers two acres of ground space and will be modern throughout. Almost the entire operation, except for a portion of the office, is on one floor to give the utmost in efficiency. Facilities include loading docks and private railroad switches directly into the warehouse. The structure is designed for air conditioning when equipment can be secured.

In addition to its plant at Indianapolis, the company has large branches at Terre Haute and Evansville, Ind., Columbus, O., and Louisville, Ky. The White River Paper Mills, a subsidiary, now primarily occupied in making toilet paper for the Army, occupies one section of the building, though a portion of its products still go for civilian needs. The Standard Paper Company, a special selling subsidiary, also will be housed in the new structure.

OPA Export Price Control

The fourth of the series of forums on O.P.A. problems being conducted under the auspices of the O.P.A. committee of the Federal Bar Association of New York, New Jersey and Connecticut, of which A. Philip Woolfson, formerly with the O.P.A. in Washington, D. C., is chairman, will take place on June 26 at 8 o'clock at the United States Court House, Foley Square, New York City.

The speakers will be Milton M. Thompson, division counsel of the Services and Foreign Trade Price Division of the Washington office and Frederick E. Busse, Chief Counsel of the Services Price Legal Section, also of the Washington office.

Mr. Thompson will discuss the legal basis and economic objective of export-import price control, the techniques employed by the two regulations and the most important problems which have arisen in their administration.

Mr. Busse will speak on "Services Under Price Control" with particular emphasis on problems which have arisen in the administration of MPR 165.

At the conclusion of the lectures there will be an opportunity for questions.

The committee is arranging a further series of three forums on O.P.A. enforcement problems at which representatives of the operating staff of the New York O.P.A. office will participate. These meetings will be held in July, August and September. The exact dates and the names of the speakers will be announced later.

Tickets of admission for which there will be no charge, may be obtained by sending a self-addressed stamped envelope to Mr. Woolfson, 67 Wall street, New York City.

PUT THE ARCH ENEMY OF CLEAN PULP AND PAPER BEHIND BARS

Now is the time to prepare for stiffer competition. Only the cleanest papers will have a place in the future for people appreciate clean paper.

Over 300 pulp and paper mills throughout the world have found Vortraps a simple, economical and efficient means of overcoming troublesome dirt problems. They substantially add to the useful life of wires and felts.

Floor space occupied is small and piping changes necessary to fit Vortraps into existing systems are few.

Vortraps contain no moving parts, use little power, are on the job 24 hours and require practically no labor to operate.

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CIO Wins at Two Mills

The Paper Workers Organizing Committee—CIO has won exclusive bargaining rights for the employees of the S. Austin Bicking Paper Company mill, Downingtown, Pa., and the Container Corporation of America mill at Anderson, Ind.

The vote at the Bicking plant was 74 for PWOC-CIO, to 29 for the Brotherhood of Papermakers-AFL, and 1 for no union.

The Container corporation poll resulted in 87 votes for PWOC-CIO, to 3 for the International Printing Pressmen and Assistants, AFL, and 4 for neither.

Kemmerer Joins AFPI

WASHINGTON, D. C., June 11, 1945—Bert Kemmerer, recently with the American Forestry Association, is a new addition to the public relations staff of the American Forest Products Industries, Inc., in Washington, D. C.

Mr. Kemmerer has served as editor, managing editor, and reporter on various publications. He is a veteran of World War II in which he served as a captain in the Ordnance. He first entered the service in 1916 as a cavalryman on the Mexican Border.

In World War I he served as an infantryman in the Thirty-fifth Division, the unit in which President Harry Truman saw service as an artillery captain. Kemmerer was decorated with the Distinguished Service Cross, the Purple Heart, and the French Verdun Medal. He was cited by President Wilson, General Pershing and Lt. Gen. William M. Wright, his division commander.

Packing Materials Needed

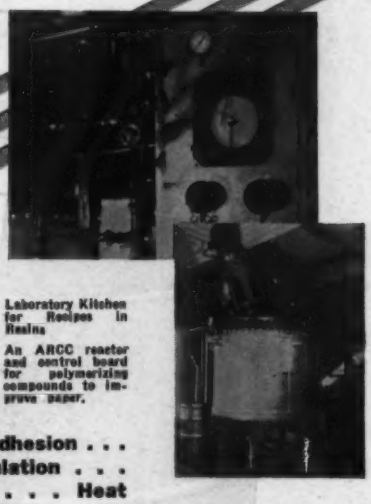
Victory in Europe presents several new responsibilities to the Quartermaster Corps, one of which is the obtaining of sufficient packing and crating materials for the redeployment of supplies from the European Theatre of Operations and the Mediterranean Theatre to the Pacific. Because it is the central purchasing office for all paper and packing products for the Army, the Jersey City Quartermaster Depot has been designated to buy tremendous quantities of packing and crating materials. According to the depot's Commanding Officer Colonel George F. Spann this special procurement project includes greaseproof and waterproof wrapping paper, case liners, adhesive tape, wadding, oil cloths, felt sheets, cloth bags, baling machines, paper pads, scales, scissors, fiberboard boxes, folding cartons, wirebound crates, stencil brushes, paint, cellophane, heavy-oil paper envelopes, labels, shipping tags and scores of other items.

Because the Army cannot and does not operate on a current day's supply of items necessary for the prosecution of war, there is accumulated in Europe today, a considerable quantity of material which can be used in the Pacific Theatre. Combat rations, intended for emergencies, are no longer needed in Europe, but canned goods and non-perishables can be used there. Deducting what will be needed by the Army of Occupation, it is estimated that 60 to 75 per cent of the Army materiel now in Europe will be recoverable for shipment.

Items now being procured at the Jersey City Quartermaster Depot will be utilized for packing and crating that percentage of supplies which belong to various technical services of the Army Service Forces. In addition, these supplies will be used to ship clothing and equipment reclaimed and reconditioned by Quartermaster Salvage and Repair Companies for re-issue in this country, or in the Pacific.

Creative resin chemistry for Paper manufacturers

ARCC



Laboratory Kitchen for Recipes in Resins

An ARCC reactor and control board for polymerizing compounds to improve paper.

Routine resin treatments for paper, polymerization of new resins for special purposes, emulsions, dispersions . . . ARCC resin compounds are properly selected and precision-made for:

Grease Proofing . . . Coating . . . Adhesion . . . Tear-Strength . . . Electrical Insulation . . . Wet-Proofing and Strengthening . . . Heat Seal . . . Age Resistance . . .

Extreme variance in production and use requirements demands formulae suited to the particular job. Arrangements for assistance (no obligation, of course) will be made promptly upon receipt of your inquiry.

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TYCOL
NO-RUST-OLS

New Powerful Rust Preventives...
Engineered for Easy Application

These new Tycol Rust Preventives solve the problem of rust prevention on: stock in storage, parts in production, and machinery standing in warehouses awaiting reconversion.

Engineered expressly to meet U. S. Army and Navy specifications, their low viscosity and low pour lend themselves to applications — down to 50° F — by spraying, brushing, swabbing or dipping. Compounded from the finest mineral oil base, Tycol NO-RUST-OLS do not dry to a wax-like coating, thus they can be removed by a simple degreasing operation.

If moisture is present — whether from indoor storage, or mild "sweating" during factory handling, call or write your nearest Tide Water Associated office for complete details about the "rust protection" afforded by Tycol NO-RUST-OLS.

DRUMS! DRUMS! DRUMS!

War needs make it imperative that all empty drums be returned immediately.

TYCOL

TYCOL INDUSTRIAL
ENGINEERED FOR EVERY

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with TYCOL

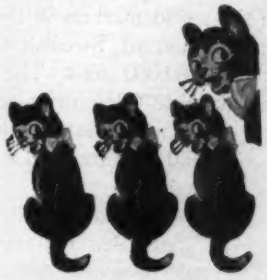
ENGINEERED LUBRICATION

Under all conditions the proved performance of Tycol lubricants more than meets their recommended service.

Rigidly controlled and tested during manufacture . . . and refined from the highest grade crudes, Tycol oils and greases (whether straight mineral or compounded) retain their uniformity* within each classification — from the first drum to the last. This unvarying high quality, plus the scope of the line, accounts for Tycol's wide acceptance among operators interested in maximum production . . . top efficiency . . . lowest operating cost.

Whatever your lubrication need, there is a Tycol oil or grease expressly engineered to afford greater economy . . . longer machine life for every type of equipment. Let a Tide Water Associated engineer help you select the best one for your particular need. Call, write or wire your nearest Tide Water Associated Office for full details.

Makers of Famous Veedol Motor Oil



*** UNIFORMITY.** For clear, concise descriptions of the basic tests used to determine important lubrication properties — Pour Point, Extreme Pressure, Uniformity and many others — consult Tide Water Associated's informative handbook "Lubricania". For your FREE copy write: Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

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PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group. Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

PULP SITUATION FAVORABLE

The future supply situation in wood pulp appears favorable, despite the heavy reservations and all-over government estimates of its varied requirements. Estimates, based upon the best available factual data, indicate increasing production and consumption of wood pulp for 1945 and 1946. In 1937, the total estimated world production of wood pulp was approximately 26,665,000 tons. Of this amount the United States produced approximately 6,573,000 tons and the remainder of the world 20,092,000 tons. In a statistical survey of the supply situation, published in January 1945, the latest world data available, the Department of Commerce issued the following computation in the first three years after V-E Day as follows: world production in the first year, including 600,000 tons of Swedish pulp, 24,348,000 tons, compared with estimated consumption needs of 23,822,000 tons, indicating a surplus of 526,000 tons. These figures appear conservative at this date, as the quantity of Swedish pulp which is expected to be available in the world markets in the twelve months following resumption of Swedish exports, will be approximately 1,200,000 tons. The United States, now that a favorable OPA price seems assured, is expected to receive more than one-half of the total Swedish supply and in excess of the 650,000 tons previously estimated.

In the estimate of the world pulp supply, the Department survey states that the estimates of world wood pulp are based upon the assumption that wood pulp production, particularly in the United States, Canada, and the Northern European countries in the first post-war year, will be at maximum capacity, consistent with conditions of manufacture, labor, and raw material supply, and that shipping from Northern Europe will be possible promptly after the end of active warfare in Europe. Reasonable allowances have been made for the factors of clearing shipping lanes, etc. in arriving at the estimates reached in this report. In the second and third years after the end of the European war estimates disclose a smaller surplus in the world's production of wood pulp, compared with consumption needs. In the second post-war year, this surplus is estimated at 124,000 tons and for the third year at 113,000 tons.

The pulp situation in the United States will, the report states, depend upon several conditions which cannot be fully appraised at the present time. This status is still not definitely known. For example, the report goes on to state, if pre-war practices are continued and there will be no international body to control the flow of wood pulp from exporting to importing countries, then it is possible that some consuming countries may suffer serious shortages and other countries may be furnished with a comparatively abundant supply. If it is assumed that the estimated consumption needs of all countries, excepting the United States, are met then the United States itself would have a moderate surplus of wood pulp in the three post-war years. However, the report points out, if the estimated world surplus were to be divided among importing countries then the surplus in any single country would be nil. On the other extreme, should some other countries obtain larger quantities of wood pulp than necessary for estimated consumption needs, then the United States might undergo a shortage.

In its estimates of world production of wood pulp, the total for the first post-war year is computed at 24,348,000 tons, compared with 26,665,000 tons in 1937: consumption needs in this period being 23,822,000 tons in the first post-war year, compared with 26,502,000 tons in 1937. Production in the second post-war year is computed at 26,365,000 tons; consumption at 26,241,000 tons. In the third post-war year, production is estimated at 28,737,000 tons and consumption needs 28,624,000 tons.

In comparing world wood pulp production with consumption needs in the important pulp producing areas of the world the Department report estimates total world production in the first post-war year at 24,348,000 tons; total U. S. production, 10,658,000 tons; world, other than U. S., 13,690,000 tons; Northern Europe, 7,309,000 tons; Western Europe, 240,000 tons; Central and Eastern Europe, 1,406,000 tons; other European countries, 686,000 tons, Canada and Newfoundland, 5,569,000 tons, and other world countries, 728,000 tons. Contrasting with these estimates are the following consumption needs: in the first post-war year, total for the world, 23,822,000 tons; total for U. S., 12,378,000 tons; world other than U. S., 11,444,000 tons; Northern Europe, 1,623,000 tons; Western Europe, 1,990,000 tons; Central and Eastern Europe, 1,561,000 tons; other European countries, 711,000 tons; Canada and Newfoundland, 4,367,000 tons, and other world countries, 804,000 tons. The production of wood pulp in other American Republics in the first post-war year is estimated at 84,000 tons, compared with 17,000 tons in 1937; consumption needs in the first post-war year are estimated at 453,000 tons.

The Department report estimates that the United States will have a net deficit of almost 4,000,000 tons of paper in the first post-war year. The annual U. S. wood pulp deficit for the three post-war years is expected to be moderately less than the deficit in most years prior to 1940. Specifically, it is anticipated that the United States wood pulp deficit in the three post-war years will be approximately 1,700,000 tons in the first year and about 1,600,000 tons in each of the following two years. From the meager factual data available at this date, a more optimistic situation is likely to materialize.

OPA Reduces Paper Work on Waste

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 20, 1945—Substantial reduction has been made in the paper work that has been required of all shippers of commercially packed wastepaper in recent weeks, the Office of Price Administration announced today. The action effective June 21, 1945, will reduce this paper work to the minimum necessary to enable OPA to check widespread ceiling price violations that are being attempted chiefly through upgrading and upweighing of wastepaper, OPA said.

In addition to eliminating or changing some of the former provisions, OPA has rewritten the new minimum requirements in still simpler fashion so that all points will be clear-cut and readily understood by the industry. Thorough consultation with wastepaper packers and other interested persons preceded today's revisions, which apply to invoicing, the furnishing of a list of details with each shipment, and record-keeping.

The requirements do not apply to loose wastepaper, such as is collected in wastepaper drives, but only to commercially packed wastepaper, which generally means wastepaper baled for commercial shipment.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
May 5	90.7	May 6	88.9
May 12	85.4	May 13	87.6
May 19	92.5	May 20	90.7
May 26	92.0	May 27	90.0
June 2	87.9	June 3	86.1
June 9	*92.8*	June 10	90.7

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	82.4	88.1
1945	86.7	89.4	90.2	88.1	*89.8*								

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	67.4	79.7	86.6	92.8	100.3	88.9	88.4	*88.8*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

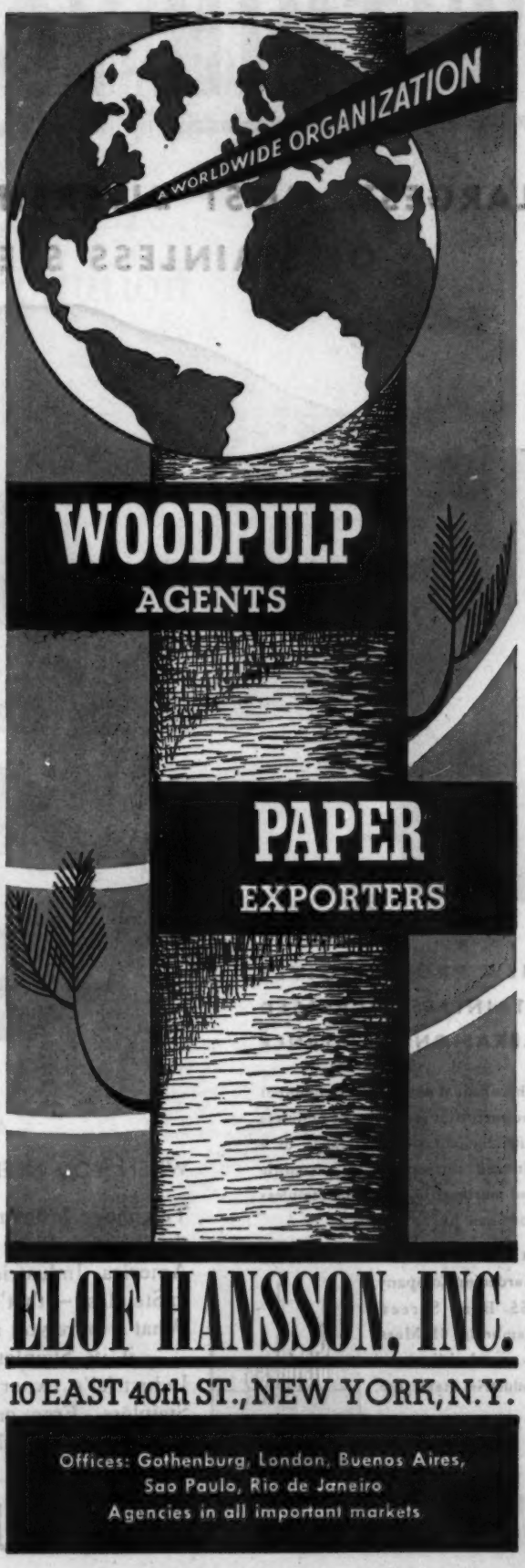
*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
May 5	97	May 6	98
May 12	94	May 13	95
May 19	97	May 20	97
May 26	97	May 27	96
June 2	93	June 3	93
June 9	97	June 10	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96								

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



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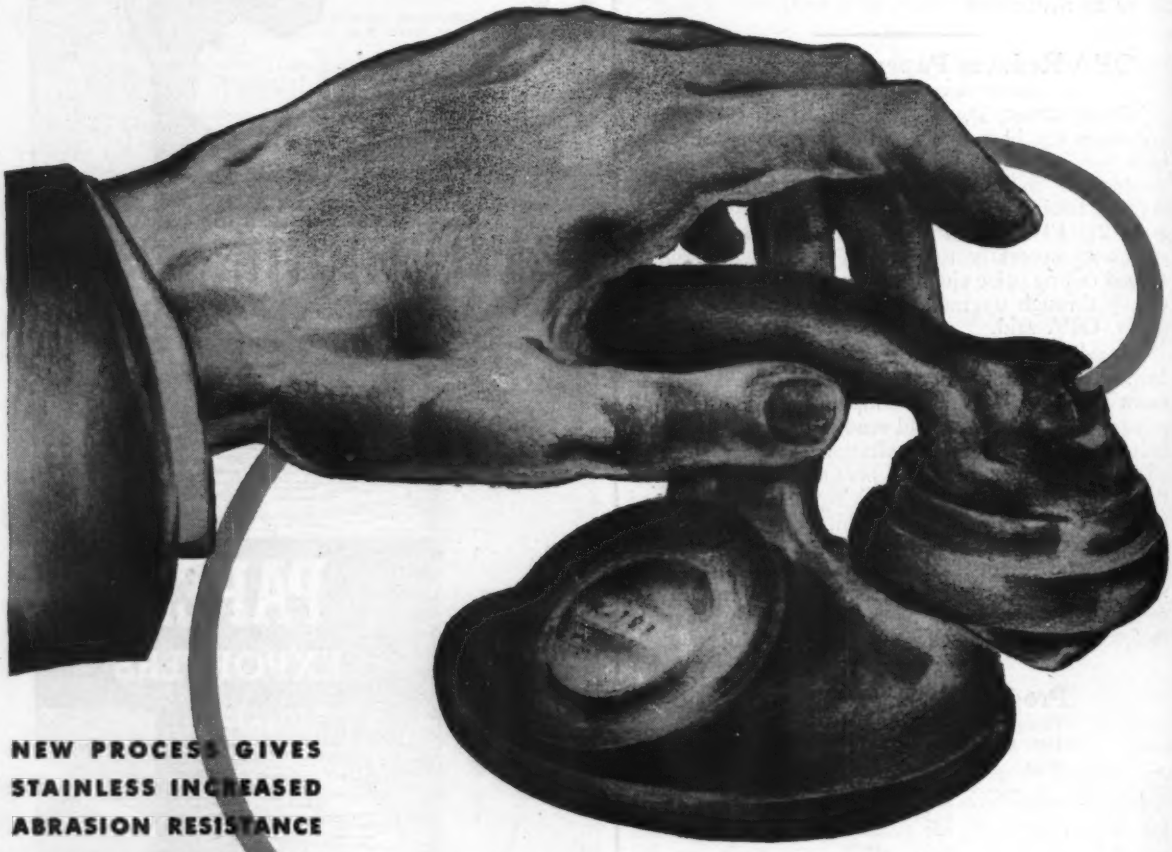

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Stream Pollution*

By E. Sherman Chase[1]

Abstract

Stream pollution can be divided into two types: natural and artificial or manmade in origin. Of the artificial group sewage is most important in respect to public health but industrial wastes also impose serious problems.

A brief outline is given of the types of wastes, their effects on the streams and rivers and on water treatment plants, and the methods of treatment. The Androscoggin River is cited as a specific example of gross pollution.

The pollution of streams has of recent years received increasing attention. However, stream pollution has been given much study by public health officials, engineers, and chemists over a period of many decades. In England, where densities of population and industrial activity reached substantial magnitudes earlier than in the United States, the problem of stream pollution became acute as long ago as the middle of the last century. Stream pollution conditions in England were also aggravated by the small size of the rivers compared with the quantities of wastes and sewage discharged into them. In New England conditions with respect to population densities and industrial activity became more nearly comparable to those of England than in most other parts of the country. Consequently New England is the scene of the earliest demands to correct stream pollution by treatment of sewage and industrial wastes.

Types of Pollution

In nature there is no such thing as absolutely pure water. Even streams flowing through unpopulated regions contain impurities washed from the surface of the ground by rainfall or derived from the solution of chemical salts by percolating ground water. However, this so-called "natural" pollution is insignificant as compared with the pollution of artificial or manmade origin.

With the introduction of the water carriage system for the removal of household and commercial wastes, the problem of the ultimate disposal of these wastes became acute. In the early days the easiest way to get rid of material carried by the sewer systems was to discharge the material into the nearest water course. So long as the quantity of sewage compared with the volume of diluting water was small and provided no water supply was seriously affected thereby, this method of disposal was reasonably satisfactory. On the other hand, as the concentration of sewage pollution increased or where water supplies were taken from the receiving body of water, then the need for some form of corrective measures came to the front.

In the case of industrial wastes the same course of action was followed with respect to their disposal as in the case of sewage. On the whole, industrial wastes have been of less significance as regards hazards to public health than in the case of sewage.

Effect of Pollution

The effect of sewage and of wastes upon the waters into which they are discharged is to cause discoloration, turbidity, stimulation of fungus and algae growths, depletion of dissolved oxygen, extermination of fish life, putrefaction accompanied by objectionable odors, deposits affecting navigation, and in the case of sewage, infection of water supplies, recreational waters, and shellfish areas with disease germs.

Certain industrial wastes contain toxic constituents sufficient to destroy fish life, while acid mine waters, phenol wastes from gas plants, saline wastes from salt works and oil wells, and wastes from chemical works render proper purification of waters for domestic use difficult and in some cases almost impracticable. As a matter of fact, practically all wastes tend to increase the burden placed upon plants for the purification of water for domestic use.

Streams carrying tannery wastes may convey anthrax bacilli to pasture lands, relatively small quantities of glue factory wastes have caused excessive foaming of waters of large rivers, thus interfering with their use for recreation, while waters have been rendered unsatisfactory for irrigation of crops by the wastes from mines and ore refineries, and large quantities of pulp and paper mill wastes have so depleted the oxygen content of streams as to bring about offensive aerial nuisance because of the production of hydrogen sulphide and other obnoxious odors. Gross pollution by either sewage or industrial wastes may bring about a condition of nuisance as a result of obnoxious odors affecting the aesthetic sensibilities of those living along the banks of the stream or having occasion to use it for recreation. Pollution may also seriously interfere with the recreational use of the otherwise suitable body of water, particularly as regards boating, bathing, and the establishment of summer cottages along the shores. Aquatic life such as fish and normal vegetation may be killed off by excessive pollution from the uncontrolled discharge of sewage or industrial wastes. Of paramount importance, of course, is the public health aspect of pollution, the most serious of which is the infection of

[1] Metcalf & Eddy, Engineers, Boston, Mass.

* Presented at the meeting of the Connecticut Valley Division of the Superintendents Association and the New England Section of the Technical Association of the Pulp and Paper Industry held in Norwich, Conn., May 25, 1945.

public water supplies by disease bacteria. Fortunately most public water supplies in this country today if they are taken from polluted streams are sufficiently purified to render their use without serious hazard to health. However, where supplies are taken from polluted streams the production of water of continuously safe quality is a matter of great importance and one which requires the utmost of skill and vigilance. Of somewhat less serious consequence is the possibility of infection of bathers using polluted streams for recreation. On the other hand, in coastal waters the pollution of shellfish areas is a matter of public health and economic significance. In many areas along the New England coast the taking of shellfish has been forbidden by the health authorities because of the undue pollution by sewage of the waters over those areas.

Industrial Wastes

Industrial wastes may be grouped into three main classes—animal, vegetable, and mineral, according to the nature and origin of their predominating ingredients. This grouping indicates roughly the relative rapidity of putrefaction.

Some of the wastes of animal origin are from dairies, the fertilizing industry, the glue industry, the leatherboard industry, packing houses, soap factories, tanneries, wool scouring plants, and woolen textile mills. Wastes of vegetable origin are derived from the beet sugar industry, the canning industry, the manufacture of corn products, cotton textile mills, distilleries, pulp and paper mills, the rubber industry, saw mills, strawboard plants, and the wood distillation industry. Examples of wastes of mineral origin are those derived from bleacheries, the chemical industry, dyeworks, gas plants, metal working establishments, mines, ammunition factories, oil refineries, oil wells, salt works, and water purification plants. Industrial wastes are often mixtures of materials of more than one class. For example, tannery wastes may contain animal fleshings, bark extractions, and spent lime.

Effect of Industrial Wastes upon Municipal Sewers

In some municipalities the industrial wastes are discharged into the sewers of the city. This places the burden of the disposal upon the municipality. If the volume of sewage compared with the volume of industrial wastes is large and if the concentration of impurities in the industrial wastes is sufficiently low or of a sufficiently innocuous character, then the results of the discharge of the wastes into the sewers are inconsequential. On the other hand, if the volume of wastes and their character are such as to adversely change the character, volume, and concentration of the sewage, then the municipality is faced with a very considerable problem in connection with the treatment of the combined sewage and industrial wastes flow. In certain cities like Chicago, Akron, Gloversville, and Fostoria, Ohio, the inclusion of industrial wastes with the sewage has resulted in difficulty in the treatment of the sewage of the city. In some cases the discharge of wastes has been to have the effect of increasing the population equivalent of the sewage from 50 to 500%. As can be readily seen, such additional burdens result in greatly increasing the cost of treating the sewage. Furthermore, some wastes, such as acid pickling liquors, are detrimental to biological action and may require changes in plant and processes otherwise adapted for sewage treatment. In other cases wastes have been used to advantage as at the old sewage plant in Worcester, Massachusetts, where iron sulphate from pickling liquors was at times of much assistance in the development of chemical precipitation with the use of lime.

Some cities have insisted upon partial treatment of wastes before discharge into sewers as at tanneries where tanks and screens have been installed for the removal of suspended solids. Many cities have ordinances which prohibit the discharge of substances injurious to sewers and other structures and which interfere with the treatment of sewage.

Treatment of Sewage and Industrial Wastes

The treatment of sewage and wastes is required to prevent the contamination of domestic water supplies, damage to commercial fisheries, particularly shellfish areas, offensive odors, pollution of industrial process waters, infection of cattle, and pollution of streams and other bodies of water to a degree which would preclude their use for fishing, boating, bathing, camping, and other recreation.

Methods of Treatment.—In general, methods for treatment of wastes fall into two broad categories. First, the removal of suspended matters, and second, the oxidation of dissolved organic impurities. Where water supplies are involved, disinfection of the final effluent with chlorine may be required. With certain types of wastes, especial adaptations of common methods must be made or new methods developed.

Sedimentation, with or without secondary treatment, is generally used for preliminary treatment. In the case of industrial wastes plain sedimentation and chemical precipitation are both in use for treating wastes containing large quantities of suspended solids. In recent years sedimentation tanks are generally equipped with mechanical devices for the removal of settled solids or sludge. In the case of the oxidation processes sand filters, trickling filters, and the activated sludge process such as are used for sewage may be adapted for certain wastes.

One of the most serious problems in connection with the treatment of sewage and industrial wastes is the disposal of the sludge produced. Recovery and utilization of suspended cellulose fibers and the sludge from paper mill and rubber reclaiming wastes has been accomplished in a few instances. The dewatering of the sludge can frequently be accomplished by filter presses or vacuum filters and in the case of older treatment plants the use of porous beds of sand and cinders has been found economical. The dewatered sludge can be disposed of by filling in low ground or in some cases for local use as fertilizer.

In the pulp and paper industry, as is known, investigations have been carried on for many years looking toward the recovery and utilization of by-products from the wastes discharged. Some progress has been made along this line in the way of the production of commercial alcohol and in the manufacture of vanillin. However, if all the pulp and paper mills in the country were to proceed to recover such by-products from their wastes, the market for these products would be so glutted as to render recovery processes economically unsound.

Androscoggin River Pollution

A specific example of gross pollution of a stream by pulp and paper mill wastes has recently been studied by our office; the author refers to the Androscoggin River. This river rises at the junction of the states of Maine and New Hampshire and the Province of Quebec and flows in a generally southerly direction to Gorham, New Hampshire, thence easterly to Maine, and thence to tide water at Brunswick. In

general, the watershed is sparsely settled but because of water power there are many industries along the stream, the principal ones manufacturing cotton goods and pulp and paper.

CONDITION

For a distance of 130 miles from Berlin, New Hampshire, to Brunswick, Maine, the river is grossly polluted. During recent summers obnoxious odors emanated from the stream to the great discomfort of the residents of the valley. The year 1941, in particular, was deficient in rainfall, which resulted in low stream flow. Furthermore, there was intense industrial activity in the river valley. These circumstances resulted in such concentration of pollution as to render the water objectionable from Berlin to Brunswick. Odors of hydrogen sulphide were obnoxious and far reaching in the vicinity of Lewiston and Auburn and occurred to somewhat lesser extent at other points along the river. Dissolved oxygen was absent from the river waters at many points in its course. Masses of sludge and banks of sludge below Berlin and above Brunswick gave off most objectionable odors at certain spots. Few streams of comparable size in the United States have been found to be so grossly polluted.

Court action brought against the pulp and paper mills by the Attorney General of the state resulted in a court decree calling for the paper mills to reduce the quantity of wastes discharged to the stream. Measures are benig taken by the industry to carry out the the court orders. For treatment lagooning of concentrated blowdown liquors for digesters and the discharge during periods of cold weather and high stream flows is recommended.

Government Control

Massachusetts was one of the pioneer states to undertake the correction of stream pollution. Some 70 years ago an act was passed in this state calling for an investigation and report upon stream pollution by the state board of health. The board was later given jurisdiction in the matter and in 1888 started the Lawrence experiment station for investigating the treatment of sewage and industrial wastes. These investigations have been of paramount importance.

The control of stream pollution is, in general, under the jurisdiction of state health departments. In some states pollution affecting fish life comes under the oversight of conservatoin commissioners of fish and game bureaus, while other states have created special boards to handle the problem. In recent years the United States Public Health Service has carried out many extensive investigations of stream pollution and has published many bulletins dealing with the subject.

More and more attention is being given throughout the whole country in this matter of stream pollution. It is probable that more and more drastic legislation will be enacted, both by the federal government and state governments, looking toward the restoration of the waterways to a condition approaching the pristine purity of colonial days. It is possible to achieve this goal but at the present time the cost of immediate countrywide achievement of the goal would involve substantial expenditures. It is, however, possible to prevent gross nuisances and serious menaces to public health by measures economically possible. Progress must be made but it must be made a step at a time and with due consideration to the overall economic picture.

Industry Backs Forestry Training

[FROM OUR REGULAR CORRESPONDENT]

ATLANTA, June 18, 1945—The Southern Pulpwood Conservation Association announces a new forestry educational project for farm youth to be financed by the pulp and paper industry of the South. Member mills of the Association, states H. J. Malsberger, forester, will undertake the project in their respective states as rapidly as plans can be completed in cooperation with the state extension services, forestry departments, vocational agricultural divisions, and other agencies active in such educational and demonstrational programs. Forestry training camps are not entirely new in the South since several states have operated them for years but this is the first unified effort by a wood using industry to spread them to all southern states.

The initial camp under this Southern Pulpwood Conservation Association program will be held in Georgia this summer at the Laura S. Walker state park near Waycross. The Union Bag and Paper Corporation and the Brunswick Pulp and Paper Company will finance the expenses of sending 50 4H Club boys to a one-week camp. J. E. Phillips, extension forester for the Georgia Extension Service and County Agents will select the boys on the basis of outstanding work performed in their 4H Club forestry projects during the school year. State Forester Tinker and his organization in cooperation with Mr. Phillips' personnel will provide the teaching staff.

These boys will learn how to manage their timber crop on the farm to the best advantage for continuous income. They will learn how to control forest fires which destroy timber values; collect pine cones, extract seed, and raise their own seedlings to be transplanted on idle or wornout farm land; estimate the value of their timber crop; and by actual training in the woods learn how to select and judge the trees which should be cut for various forest products such as fuelwood, pulpwood, ties, veneer blocks, poles and piling, and sawlogs.

Crane Advances Branch Personnel

Crane Company has announced changes in its sales and branch house division, effective June 16. Carter T. Pollock, formerly manager of Crane's Chicago branch, is appointed manager of the Central District with headquarters in Chicago. W. A. Burbine, formerly manager of the company's Cleveland branch is made manager of the Chicago branch, A. N. Rosborough, formerly manager of the Toledo branch is appointed manager of the Crane branch in Cleveland. W. D. LaRue, manager of the Muncie, Ind., branch, is promoted to the managership of the Toledo branch. R. C. Danielson, formerly manager of the plumbing department at the Indianapolis branch, is made manager of the Muncie branch, replacing Mr. LaRue.

Consolidated Advances Henderson

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 18, 1945—George Henderson, comptroller of Consolidated Paper Corporation since its organization in 1931, has been appointed vice-president of that corporation. Mr. Henderson's connection with the industry dates back to 1918, when he became comptroller of Wayagamack Pulp and Paper Company at Three Rivers (since incorporated into Consolidated Paper Corporation).

Impeller Agitation*

By J. W. Couture[1]

Abstract

Agitation can be divided into two major headings: circulation in which the mixture is merely held in suspension and blending in which the mixture is intermixed.

Various types of equipment perform certain functions depending on the requirements. Several such units are described and data are given on their action.

At the outset, one thing should be made positively clear, and that is, absolutely nothing in nature is derived from nothing. Therefore, everything accomplished in the nature of work must always be at the expense of something else. This law is as true for agitation as for any other phase of engineering.

Even the Heavenly bodies follow this law, in that each and every star in the known part of the universe, anyway, has the same kinetic energy as every other star, thus the sun has the same kinetic energy as Antares, the largest known star. The sun, being smaller, travels through the Heavens at a much faster rate than the heavier star; therefore, substituting in the well known equation $KE = \frac{1}{2} mv^2$ the mass and velocity of both stars, the answers would probably be approximately the same.

The above lengthy discussion proves indisputably that energy must be expanded in order to accomplish work and work is only another term for horsepower. Logically then, the only move left is the improving of the designs of the agitating units under consideration. The more efficiency built in these units, the greater is the agitation for any given expanded horsepower. This naturally stems back to experience and "know how."

For almost as long as any kind of paper has been manufactured, it has been rather clearly recognized that the stock or stuff must be kept quite well agitated, keeping each and every fiber in suspension in its supporting medium, for the case under discussion, water. Undoubtedly, one of the first pieces of equipment that suggested itself to the paper trade, because of the round construction of vertical or horizontal chests, was a simple paddle type agitator which in its time did a creditable job inasmuch as consistencies, machine speed, etc., were not as high then as they are today. It was indisputably an inefficient machine and did a very poor job of circulating agitation or blending. (Note the difference between circulating agitation and blending—later this shall be covered in more detail.)

Equipment Development

For an extremely long time various papermakers, in conjunction with equipment manufacturers, have been keenly interested in efficient circulating agitation and blending, knowing full well its value to the trade, in the important fact that even consistencies held throughout the complete papermaking process would speed up the machines, also making a better sheet.

The Dilts Machine Works, as well as Shartle Bros. and their Canadian manufacturer, The Alexander Fleck Ltd. in Ottawa, Canada, undertook an extensive study with the view of formulating a policy for the channeling of the design of various types of agitators with respect to specific jobs, covering the complete field.

The above three mentioned companies are probably the only ones in the world who build a complete line of agitators; that is, if paddle type with propeller, Class L, and Agi-flo types of agitators are included. Thus, as any individual condition differs from any other encountered in any paper mill, it can be properly handled, because of the unlimited choice of equipment at their disposal. No one type can possibly do all jobs or be a cure all.

A considerable amount of study and questioning vividly brought out the fact that no two papermakers agree on which is the best type of agitator for any given job or the best agitation for optimum results. Therefore, it became immediately clear that no one type of agitator would properly serve all of the ramifications of this problem and an attempt was made to present the problem under two major headings.

One would generally be considered merely as a circulating agitation problem in which the fibers would merely be held in suspension with the minimum of blending obtained, e.g., if a red ball were put in one end of the chest and a blue in the other, they would circulate but never get together. In other words, there would be no blending.

The other would be what is commonly known as a blending chest in which the fibers would be intermixed and reintermixed in order to even out consistencies and thoroughly prepare the stock for the jordans or the paper machine. As in the above paragraph, if red balls in one part of the chest are introduced and blue in the other, in a very short time they would be completely intermixed. Good papermaking consists of obtaining and holding a uniform set of conditions. Consequently, the more blending that is done, the more likely one will arrive at such a condition.

The author shall reiterate the above statements again, pointing out that circulating chests merely accomplish what the name implies and are generally found in the breaker beater room or at the beginning of the papermaking cycle. Blending chests also accomplish what its name implies and are generally found during the latter stages of papermaking. However, the types of chests accomplishing these tasks are many and varied.

It is, therefore, clearly obvious that only through an exact knowledge of conditions to be met can the proper equipment be supplied and desired results accomplished.

Initially, it was realized that wood fiber, having a consistency of over 3%, is a most inert, stubborn, bulky, sticky, and difficult to handle material, as all probably know from many sad and often costly experiences of the past. Therefore attempts to accomplish the most amount of work for the least expenditure of power with respect to various conditions to be met were made, keeping these facts in mind.

* Presented at the meeting of the Superintendents Association held in Cornwall, Ont., May 18-19, 1945.

[1] Chief Engineer, Dilts Machine Works, Fulton, N. Y.

Propeller Agitators

Discussing propeller agitators, first it should be mentioned that a good many men from many walks of life have made contributions to the present knowledge and it should be thoroughly understood that the following information was correlated from contributions of these men.

It was decided in the beginning to make the channel width approximately 1½ times the propeller diameter or less for stock over 3½% consistency. This is variable with respect to the kind of stock used and experience is necessary for the proper arrival at good judgment. The stock depth would be about twice the width of the channel, also depending upon consistency. The length of the channel circuit under ordinary circumstances would not be much more than 80 feet otherwise a propeller would be installed at both ends of the chest.

Through experience, an equation was set up for a velocity factor which has to do with the type of chest, the wall friction, stock depth, and velocity in feet per minute of the stock itself.

A consistency factor was then evolved which has worked out very well, thus taking into due consideration the inherent changes which occur in the mass as the consistency increases or decreases.

Furthermore, there was also introduced what is called "an experience factor" which ties in with kraft, sulphite, groundwood, waste paper, and freeness, the latter if available.

Even with all of the above information, it is absolutely impossible to correctly apply a piece of equipment unless all the mill conditions are known.

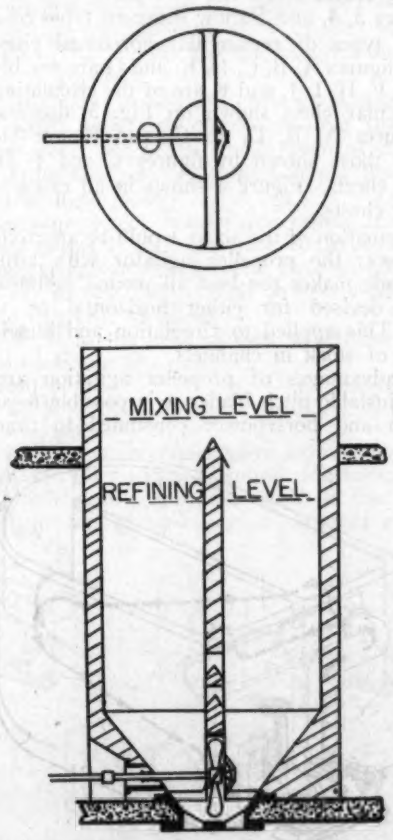


FIG. 1
Vertical Hydracycle Tank

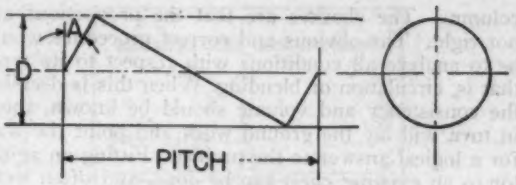


FIG. 2
Fundamental Formulas for Propellers

A = Pitch Angle Tip: Pitch = $D\,\pi\,\tan A$:

$$\text{Area} = \frac{\pi D^2}{4} = 0.7854\,D^2;\quad N = \text{R.p.m.}$$

$$\text{Volume per rev. cu. ft.} = \text{Pitch} \times \text{Area} = D\,\pi\tan A \times \frac{\pi D^2}{4} = \frac{D^3\pi^2\tan A}{4} = 2.47\,D^3\tan A$$

$$\text{Volume per rev. cu. ft. for 25° blades} = 1.152D^3$$

$$\text{Velocity per second} = \frac{\text{Pitch} \times \text{R.p.m.}}{60} = \frac{\pi DN\tan A}{60} = \frac{ND\tan A}{19.1}$$

$$\text{Velocity per second for 25° blades} = \frac{ND}{41.0}$$

$$\text{Head} .\!-\!.\ V = \sqrt{2GH}\ \therefore\ H = \frac{V^2}{\left(\frac{2G}{\frac{N D\tan A}{19.1}}\right)^2} \times \frac{1}{2G} = \frac{(N D\tan A)^2}{23494}$$

$$\text{Head for 25° blades} = \frac{(ND \times .4663)^2}{23494} = \frac{N^2 D^2}{108{,}100}$$

$$\text{H.p.} \frac{\text{Volume} \times \text{Weight} \times \text{Head} \times \text{R.p.m.}}{33{,}000} = \frac{1}{33{,}000} \times \frac{D^3\pi^3\tan A}{4} \times 62.5 \times N \times \frac{N^2 D^2\tan^2 A}{23494} = \frac{D^5\pi^3 N^3\tan^3 A \times 62.5}{4 \times 33{,}000 \times 23494} = \frac{D^5 N^3\tan^3 A}{5{,}030{,}000}$$

$$\text{H.p. for 25° blades} = \frac{D^5 N^3}{49{,}600{,}000}$$

Note: All the above calculations are based on a theoretical case. Practical use must take into consideration area of shaft and hub, blade thickness and the efficiency of the propeller in the liquid under investigation.

Generally, the paper mill engineering department will send in a drawing showing the chest outline, requesting specifications for equipment to agitate the chest, which in turn has been designed around building

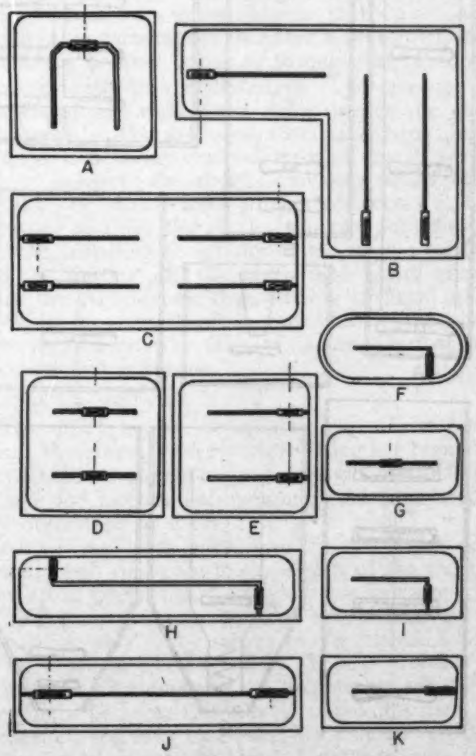


FIG. 3
Rectangular Chest Diagrams—Horizontal Agitators

columns. The chances are that the proportions are not right. The obvious and correct procedure would be to analyze all conditions with respect to its type, that is, circulation or blending. When this is decided, the consistency and volume should be known, these in turn will lay the ground work and point the way for a logical answer to the problem. Fitting an agitator to an existing chest can be done, and often well, but the law of averages is against such a procedure.

There is one novel type of propeller tank which should be discussed in greater detail and that is the vertical Hydracycle tank. They are of the cycling and blending type, conceived, designed and patented by Howard Hyman of Alexander Fleck Ltd. to meet a special need in cycling, blending as well as refining. It is believed this represents one of the latest developments in tank design. These tanks are available for purposes other than refining, such as a normal stock tank, as they have excellent dumping characteristics. A tank 10 foot diameter and approximately 20 foot high empties itself in 1 minute and 30 seconds. The washability, visibility and measuring batches for combination furnishes makes it a very excellent tank. Figure 1 shows its physical overall outline. The above mentioned points become immediately apparent.

The formulas embodying the fundamental concepts for the theoretical design of a propeller is shown in Fig. 2. It must be remembered this is a theoretical formula and various correction factors must be applied with respect to the liquid it is to circulate and the type chest to which it will be applied. However, it is believed the information given thereon is useful and is not to be found in any ordinary book. Note that an angle of 25° has been assumed for the purpose of simplification, therefore, any other angle used will necessitate merely the changing of the numerical factors.

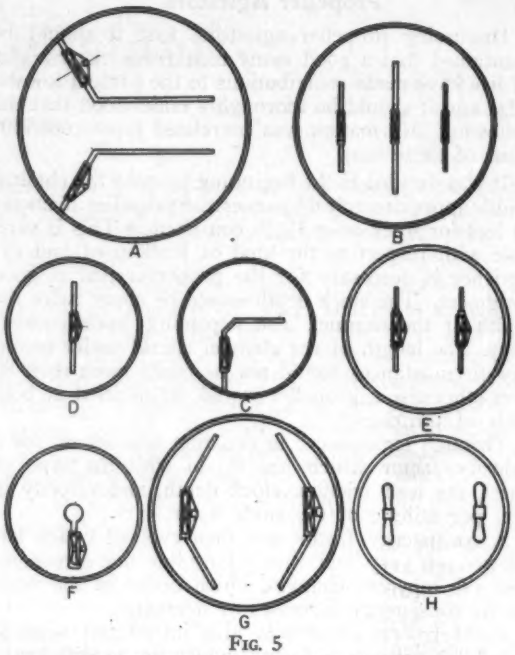


FIG. 5
Circular Chest Diagrams—Horizontal Agitators

Figures 3, 4, and 5 show different types of chests. Various types of rectangular horizontal chests are shown; figures A, B, C, D, E, and G are for blending whereas F, H, I, J, and K are of the circulating type. The circular chest shown on Fig. 5 also indicates that figures A, B, D, E, G, and H are blending whereas those shown by figures C and F are circulating chests. Figure 4 shows in all cases vertical blending chests.

A summation of the above would be approximately as follows: the propeller agitator with adjustable pitch blade makes the best all-around agitation that can be devised for either horizontal or vertical chests. This applied to circulation and blending or flowage of stock in channels.

The advantages of propeller agitation are that, with adjustable pitch blades it is possible to suit the agitation and horsepower consumed to practically

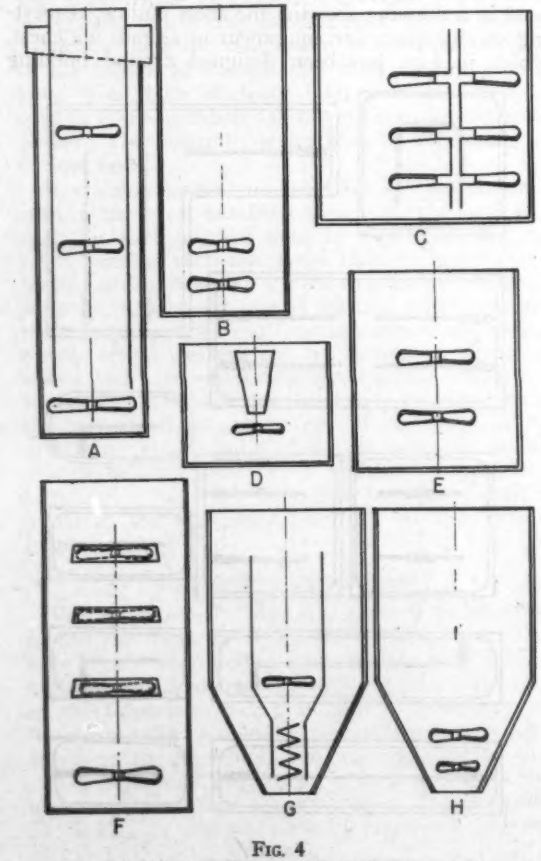


FIG. 4
Circular Chest Diagrams—Vertical Agitators

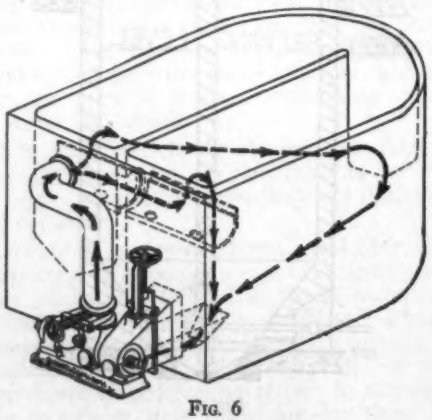


FIG. 6
Class L Agitator

the exact requirements of the stock being agitated.

The full chest volume can be used since the bottom requires very little pitch. It is necessary to fillet the corners and provide for a slight slope. All this, however, is negligible with respect to the complete volume.

The stock outlet to the pump is always located in the lowest part of the chest and the center line of the pump should be such that the suction is always flooded, thereby, providing for continuous gravity flow, precluding any possibility the pump will become air bound.

The stock velocity in the channels should be in the order of 15 to 25 feet per minute. This, however, is entirely dependent upon the circular length of the chest and therefore is subject to modification.

Pump Agitator

There is another full line of agitators very different from the propeller type but no less efficient and equally as good; as a matter of fact, in a great many places they are to be preferred. They are divided in the following major types.

Agi-Flo Pumps

The prime reason for an Agi-flo pump is to produce a constant head by means of a centrifugal pump and to agitate the stock in the chest, both jobs being done by one motor. These pumps must always be installed on a correctly designed chest only. They are to be made large enough in order to produce a flow in the channel anywhere from 12 to 18 feet per minute. All pumps must be set low enough so that the stock will drain into the pump; therefore, it is important to get sufficient slope on the bottom of the chest so that the stock at the required density will flow to this opening.

The minimum slope for a chest of this design for mixed paper and fairly smooth floating stock is ¼ inch per foot; for brash stocks, such as raw kraft direct from the pulp mill, that do not flow easily, slope 1 inch per foot.

A very important feature concerning the bottom of these chests is that they are constructed of the bisected triangular design. The limit of consistency is 6% for successful operation on nearly all installations of this type of pump.

The limit to the head against which the agitator part can produce is as follows:

No. 8—6 feet	No. 16—10 feet
No. 10—7 feet	No. 20—12 feet
No. 12—6 feet	No. 24—12 feet
No. 14—7 feet	No. 30—13 feet

This pump, when connected to a properly designed chest makes for an ideal blending unit because when the agitator part pumps the stock to the intermix box at the top of the chest, a required controlled

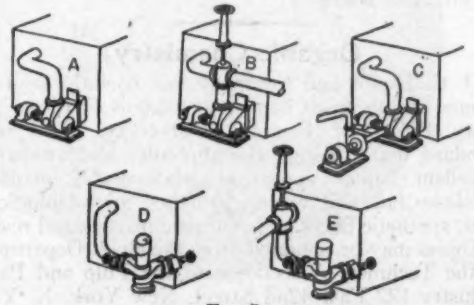


Fig. 7
Agitator Arrangements

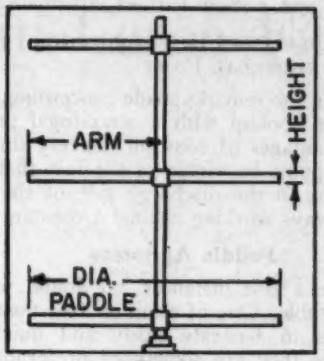


Fig. 8
Tank and Chest Agitators

Note: Formulas are approximately correct for horizontal chest.

$$\text{H.p.} = \frac{A\ \text{Vol. per Rev of One Arm} \times B\ \text{Height Raised by One Arm} \times C\ \text{No Arms} \times D\ \text{R.p.m.} \times E\ \text{Specific Gravity} \times 62.5}{33000}$$

Typical Problem:
15 r.p.m.: 6 ft. 0 in. length of arm or 12 ft. 0 in. dia. per revolution. Height 6 in. which equals width of path as arm makes one revolution. Any stock to 10% con. specific gravity equals to one: six (6) arms.
Area per r.p.m. of arm = 113 ft.² (area of 12 ft. 0 in. dia. as generated by 6 ft. 0 in. arm.
Height stock is raised = 6 in. = 0.5 ft.
No. arms = 6
R.p.m. 15
Specific gravity = 1

$$\text{H.p.} = \frac{A\ 113 \times B\ .5 \times C\ .5 \times D\ 6 \times E\ 15 \times F\ 1 \times 62.5}{33000} = 4.81\ \text{H.p. at Shaft}$$

Then take into consideration type of drive and its efficiency and add it to figure already calculated.

portion, even as great as 50% if it is needed, entering into the inlet side of the chest will short-circuit back to the discharge side, blending with the stock going into the unit thus doing a splendid job of blending. Generally speaking, this unit will work on non-stringy stocks or mixed papers that have passed through the perforations of either a perforated backfall in the breaker beater or through the perforated extractor plate in a hydrapulper. They are not recommended for stock from dump beaters or where old paper stocks are used that have been pulped without first being strained through coarse screens before going to the chest. The only faults of all installations which have proven unsuccessful have been one or three things: 1. Incorrect design of the chest, 2. installing an agitator of too small a capacity, and 3. shutting off the centrifugal pump entirely from the Agi-flo unit thus tending to burn up the stock in the centrifugal casing. All of the above, however, are not the fault of the unit but of poor selection and operation.

Class "L" Agitator

This unit is simply the agitating part of the Agi-flo pump, therefore, the centrifugal casing has been eliminated and as a result a spare pump must be furnished for intermittent pumping, the same as for any other type of chest.

All of the rules enunciated in the above paragraphs, with reference to the design of the chest, as they effect proportions, apply in this instance.

This equipment can be used very effectively for circulation only or by means of the intermix baffle, as an excellent blending chest. This is probably the only piece of equipment on the market which can seemingly perform this almost impossible feat. On a chest 20 feet long by 10 feet wide by 10 feet deep, color can be completely blended in 3½ minutes with the proper size Class "L" unit.

Figures 6 and 7 show further information.

Class "L" Agitators In Combination With Centrifugal Pump

Furthering the remarks made concerning the Class "L" agitator hookup with a centrifugal pump, this has the advantages of constant delivery through the centrifugal pump by virtue of the fact that the suction is taken on the discharge side of the agitator, which is always working against a constant head.

Paddle Agitators

There are a few instances, no doubt, where this type is desirable. One of them on free floating stock which tends to separate easily and quickly from water. Here they are sometimes preferable.

The same reasoning and logical conclusion is reached on stock that settles out easily. Such as those that are heavily clay or chalk loaded.

They are, by necessity, used mostly in either horizontal or vertical cylindrical chest. Often they will also be found in vertical continuous bleached tanks where prevention of stratification is their sole function.

Figure 8 gives the formulas for calculating the approximate horsepower required for this type of agitator.

Accident Reduction Saves Man Days

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 16, 1945—Ten thousand man days of work on critically needed paper products for the war were saved as a result of an intensive campaign to reduce accidents in the paper and pulp industry, Secretary of Labor Perkins reported today. The industry-wide safety drive was sponsored by the U. S. Department of Labor's Division of Labor Standards in cooperation with management and labor organizations, State labor departments, insurance companies, and other Government agencies.

"Work accidents did not disrupt the flow of vital war supplies as seriously from October through March as in the same six-months period a year ago in the industry because of the attention focused on accident prevention," Miss Perkins said. "Management, labor, and the cooperation agencies have every right to be proud of the drive which added 10,000 man days of work to war production. At this rate accident reduction can save the industry 20,000 man days of production and over 1¼ million dollars a year in direct and indirect costs. I am confident that this record is only a beginning for greater accomplishments in accident prevention by this important industry."

Paper and pulp mills in Southern, North Central, and New England States received special commendation from Miss Perkins for outstanding improvements in safety performance. A 37 percent reduction in the accident frequency was achieved by the group of States including Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee. An over-all reduction of almost 33 percent was made in Kentucky, Michigan, Ohio, and West Virginia, and more than 20 percent in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

A reduction of more than 15 percent was made in Pennsylvania, Maryland, and Virginia; 10 percent in Illinois, Indiana, North Dakota, South Dakota, and Wisconsin; over 7 percent in Arizona, California, Idaho, Montana, Nevada, Oregon, and Washington.

Sponsors of the safety drive, with the U. S. Department of Labor, were the American Paper and Pulp Association, International Brotherhood of Paper Makers, International Brotherhood of Pulp, Sulphite and Paper Mill Workers, American Pulp and Paper Mill Superintendents Association American Mutual Alliance, National Safety Council, American Standards Association, National Conservation Bureau, National Fire Protection Association, American Red Cross, U. S. Chamber of Commerce, State labor departments, and Federal agencies of Commerce, Agriculture and Public Health.

New TAPPI Members

Henry R. Adams, assistant technical director, Crossett Paper Mills, Crossett, Ark., a 1931 graduate of Queen's University, Canada.

Milton M. Bixby, director of sales, Hercules Powder Company, Paper Makers Chemical Dept., Wilmington, Delaware.

George B. Brown, division chief, Paper and Board Division, Johns-Manville Research Laboratory, Manville, N. J., a 1922 graduate of McGill University.

Robert D. Cowherd, application engineer (Pulp and Paper Industry), the Bristol Company, Atlanta, Ga., a 1935 graduate of the University of Cincinnati.

Franz W. Fischer, general manager, Lithgow Corporation, 333 W. 40th Place, Chicago, Ill., a 1912 graduate of the University of Michigan.

Felix J. Gleason, foreman in charge of Insulating board mill, Bird & Son, Inc., Phillipsdale, R. I., a 1938 graduate of the University of Minnesota.

Michael H. Ober, chemist. Standard Paper Manufacturing Company, Hull and Canal, Richmond 12, Va., a 1940 graduate of Virginia Polytechnic Institute.

Clifford B. Pape, president, Valley Research Corporation, Montague, Mich., a 1911 graduate of Rishworth College, England.

John F. Shea, Demonstrator, Becco Sales Corporation, Buffalo, N. Y., a 1928 graduate of Lowell Textile Institute.

Harry G. Smolens, consulting engineer, Becco Sales Corporation, Buffalo, N. Y., a 1916 graduate of Pennsylvania State College.

Joins Consolidated Machine Tool Corp.

Merle R. Wilkins has recently joined the Research Department of Consolidated Machine Tool Corporation, Rochester, New York.

Mr. Wilkins brings fifteen years of pulp and paper chemistry experience to his new position. Since 1934 he had been Chief Chemist of Bryant Paper Company, Kalamazoo, Michigan. He was previously employed as Chemist on the technical staff of Marinette and Menominee Paper Company, Marinette, Wisconsin; and in the Research Department of Brown Company, Berlin, New Hampshire.

Organic Chemistry

D. C. Heath and Company has recently issued a volume on Organic Chemistry by Louis F. Fieser and Mary Fieser of Harvard University. This is a standard text covering the aliphatics and aromatics. Excellent chapters appear on carbohydrates, including cellulose, fats and waxes, proteins, microbiologicals, dyes, synthetic fibers and synthetic plastics and resins.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry 122 East 42nd Street, New York, N. Y. at $8.00 per copy.

Development of Paper from Caroa Fiber

Electrical Insulation—Part I

By Reavis C. Sproull[1]

Abstract

A method for pulping caroa which results in a yield of 50% is given. The properties of the pulp and a 3-mil commercial paper are presented.

Sporadic efforts have been made to develop from the plant, *Neoglaziovia variegata*, popularly named caroá (craua, croa, coroa), a fiber suitable for the manufacture of technical papers for specialized industrial uses. Although a microscopic examination of this fiber shows it to be well proportioned for good papermaking qualities, the attempts to process it for papermaking have met with very limited results and the principal uses for the fiber still are found in textile applications.

Examination of Fig. 1 shows the caroa fiber to be of small diameter and cylindrical with pointed ends. These properties should produce good felting of the fibers and give compactness and strength to the resultant sheet. The fiber measurements in Table I afford a comparison between caroa and some other representative papermaking materials.

The fiber dimensions were made in accordance with TAPPI Suggested Method T 10 sm-41 "Species Identification of Nonwoody Vegetable Fibers."

As this table indicates, the fiber length to width ratio which is of primary importance in judging a fiber for its papermaking properties shows a higher value for caroa than for many of the other conventional papermaking fibers. This favorable relationship of length to width and its small diameter should give it excellent papermaking properties.

The inherent good qualities of the caroa fiber have not been convertible into fine papers because a practical method for the separation of the fiber from the plant's impurities has not been heretofore available. The waste from the textile industry's use of this fiber has been considered as suitable for the manufacture of heavy papers. Shaw and Rumsey *(1)* offer a method for processing this fiber to be used for bag and wrapping papers. Their material is cooked with alkali at 342° F. and a pressure of 120 p.s.i. U. S. patent *(2)* 1,725,335 relates to a paper made from pulp prepared from caroa by a method which employs ordinary pulp and papermaking procedures as well as standard conditions of temperature and pressure. These processes are too drastic for use on the caroa fiber and the yields are not large enough to be economically feasible. In order to produce a long, strong fiber in economical yields, it was decided to make a distinct departure from the conventional mill pulping conditions and seek a mild method suitable for preparing caroa fiber for papermaking.

TABLE I.—FIBER DIMENSIONS OF VEGETABLE FIBERS

Fiber	Length, mm. Average	Width, mm. Average	Ratio L:W
Manila hemp	6	0.018	330:1
New Zealand flax	9	0.016	560
Bamboo	2.7	0.014	190
Flax	25	0.016	1560
Hemp	20	0.022	910
Ramie	120	0.050	2400
Jute	2.0	0.020	100
Cotton	18	0.020	900
Caroa	4.0	0.010	400
Sulphite pulp	2.8	0.033	90

Process

The procedure developed to cook or digest caroa successfully consists of a two-stage process. The first stage is essentially a boiling in water at atmospheric pressure while the second stage is a mild alkaline cook at atmospheric pressures and temperatures in the range of 212°F. A pulp is obtained by this process which can easily be converted to the type paper desired by proper beating and paper machine conditions. The beating requirements are mild and economical. The fiber bundles disintegrate to a uniform fiber and the fibers hydrate readily.

A. First Stage
1. Five to ten parts of water to 1 part of fiber.
2. One hundred and ninety to 215° F.
3. Two to five hours treating time, the shorter time is used at the higher temperatures.
4. Washing at the end of this stage with water to complete the discharge of dissolved materials.

B. Second Stage
1. Alkali concentration up to 5.0% by weight of the water (less than 25% of the fiber weight).
2. Five to ten parts of liquor to 1 part of fiber by weight.
3. One hundred and ninety to 215° F.
4. Three to six hours cooking time.
5. Thorough washing, neutralization of residual alkali to pH of 7 and final washing to remove salts.

Mill Trial

A mill trial was made using a definite set of conditions falling within the ranges above and was successfully carried through to a 0.003 inch insulating paper. About 4500 pounds of raw caroa was subjected to the following set of conditions.

A. First Stage

The raw caroa fiber was cooked at 215°F. for 3 hours at a 7:1 water-to-fiber ratio, then washed to a clear discharge with neutral water. The temperature

[1] Member TAPPI; Chemist, General Electric Co., Pittsfield, Mass.

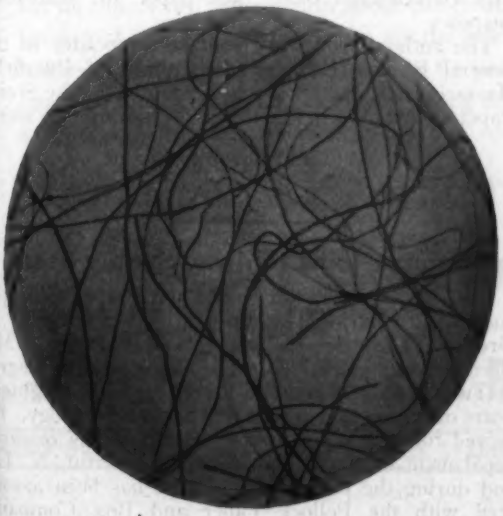


FIG. 1
Caroa (× 60)

schedule for this and the second stage is shown in Table II.

B. Second Stage

Fiber from the first stage was cooked at 215°F. for 4 hours with a 3% sodium hydroxide solution in a 7:1 liquor to fiber ratio, then washed with hot water for 2.5 hours at a rate of 175 gallons per minute to a clear discharge.

C. Paper Manufacturing Stage

One thousand pounds of the drained pulp was transferred to a beater, neutralized with dilute hydrochloric acid until a pH of 7 was maintained and finally washed with hot water for 2 hours. The pulp was then beaten to a 70 beater degree (300 ml. Schopper Riegler freeness) and converted to a 3-mil insulating paper. Throughout this stage this fiber handled very easily and was converted to a satisfactory 3-mil sheet by the use of standard and typical paper-manufacturing equipment.

TABLE II.—TEMPERATURE SCHEDULE

First Stage		Second Stage	
Time, hr.	Temperature, °F.	Time, hr.	Temperature, °F.
0	65	0	65
1	145	0.5	155
2	199	1.5	200
3	215	2.0	215
4	215	2.5	215
5	215	3.5	215
6	215	4.5	215
		5.5	215
		6.0	215

Evaluation of the beating characteristics of the mill pulp was done by a standard laboratory procedure (6500 grams on the bed plate of a Valley beater). The Schopper Riegler and Williams Precision Instrument freeness development curves are shown, respectively, in Figs. 2 and 3. To indicate the rapidity with which a caroa pulp develops in comparison to an ordinary wood pulp, a beater development composite curve for four kraft pulps is included in Fig. 2. The numbers appearing on the curves in Fig. 3 indicate the Schopper Riegler freenesses in ml. at which the Williams drainage curves were obtained.

The first stage water cook removes about 15 to 20% of the caroa as hot-water soluble material with the second stage removing about 25 to 30% more material so that the final yield of pulp is about 50%.

The cooking process causes a ten-fold decrease

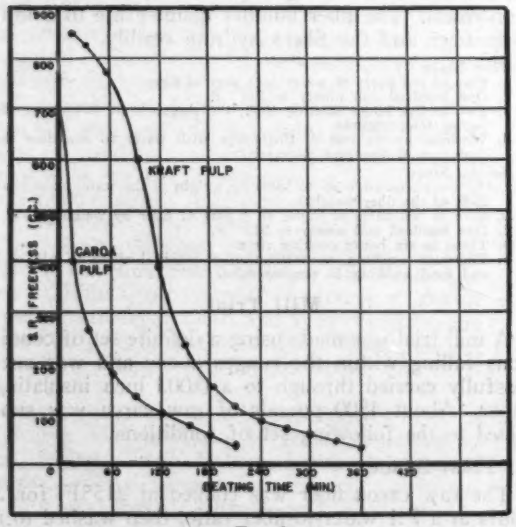


Fig. 2
Beating Development of Kraft and Caroa Pulps

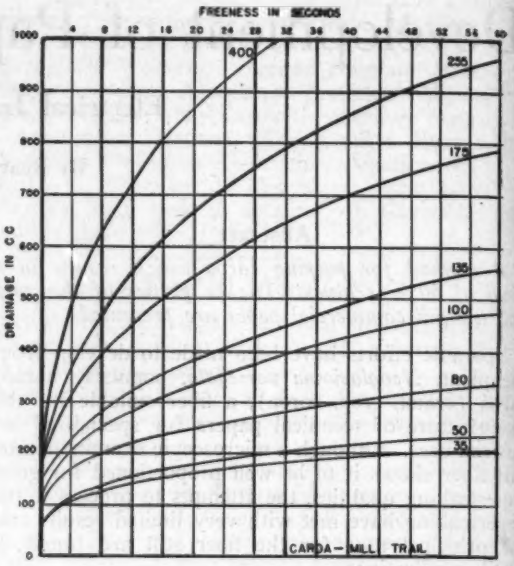


Fig. 3
Williams Precision Tester Freeness Curves

in the ash content, a 50% decrease in the lignin content, and a decrease in the per cent pentosans.

The chemical qualities of the pulp, the yield, and the papermaking characteristics vary as the chemicals for the process are varied and also depend upon the process and thoroughness of decortication. It is recognized that greater uniformity of product and more reliable yield values will be attainable when the decortication process is more thorough and uniform.

The physical characteristics of the machine-made paper are as follows:

Average thickness, in.	0.0030
Basis weight (24 × 36—500)	27
Apparent density, g./ml.	0.58
Tensile, points/100 lb.	87
Tear, g.	112
Stretch, %	3.6
Air resistance/15 seconds, cc.	73
Bursting strength, lb./sq. in.	39

These tests were made after conditioning at 50% R.H. and 72°F. Methods were essentially A.S.T.M.

This paper was quite uniform and compares well with conventional 0.003 inch paper for insulation purposes.

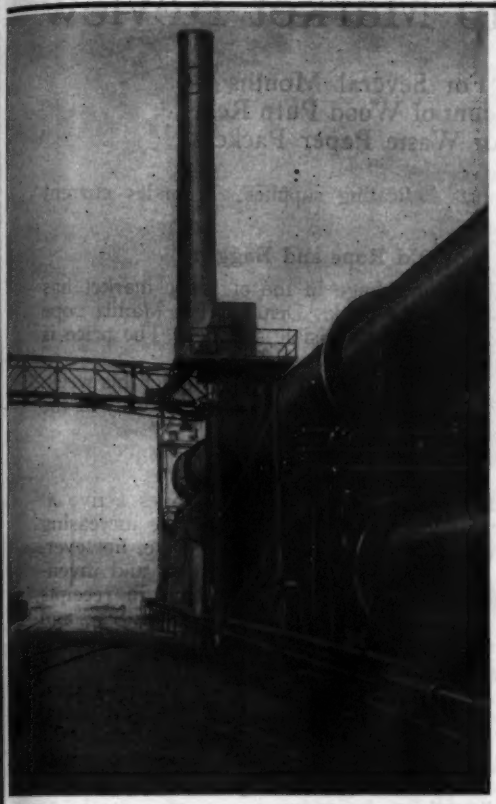
The author wishes to thank his associates in the General Electric Company Laboratory at Pittsfield, Massachusetts, and Dr. P. A. Forni now of the Smith Paper Company, for valuable assistance on this work.

Bibliography

1. Shaw and Rumsey, *Paper Trade J.* 80, No. 2, 47 (1924).
2. Brown, H. H., U. S. patent 1,725,335, "Insulation material."

Brennan Joins Railway Supply Staff

Earl M. Brennan has joined the Railway Supply and Manufacturing Company, Cincinnati, Ohio, as director of service to paper manufacturers. Mr. Brennan, who gained his chemical engineering degree at Tufts College, brings to his new position eighteen years of experience in pulp and paper technology. He served for fifteen years as a member of the research department of the Brown Company, Berlin, N. H.; and during the past three years he has been associated with the Pollock Paper and Box Company, Dallas, Texas, converters of waxed and special coated papers.



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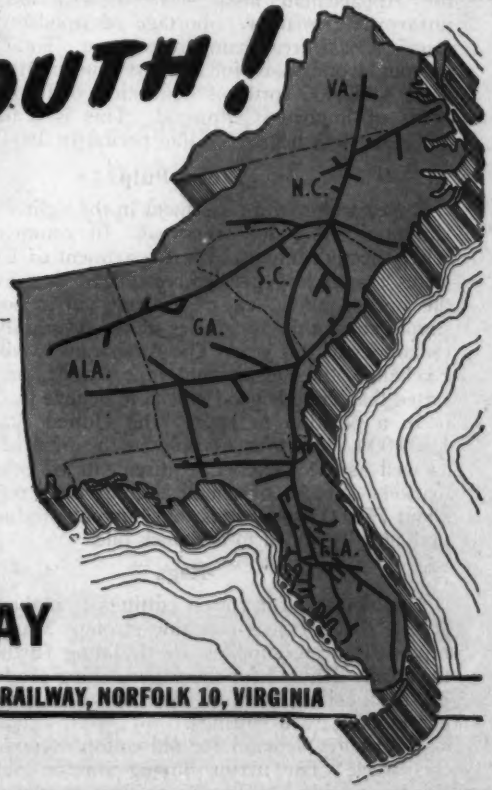

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New York Paper and Pulp Market Review

Newsprint Supply May Continue Short For Several Months — Sweden Expected To Ship Substantial Amount of Wood Pulp Relatively Soon — OPA Simplifies Details For Waste Paper Packers.

Office of the PAPER TRADE JOURNAL, Wednesday, June 20, 1945.

Demand for all-over government uses of paper continues so heavy that the prospect for an increased civilian supply is only favorable in groundwood printing and in book papers. Newsprint supply, wrapping and paperboard items are likely to continue in tight supply through the third quarter of 1945.

The index of general business activity for the week ended June 9 rose to 142.8, from 142.2 for the previous week, compared with 144.7 for the corresponding week in 1944. The index of paperboard production was 166.5, compared with 162.7 for the previous week, and with 165.0 for the corresponding week in 1944.

Paper production for the week ended June 9 was estimated at 92.8%, compared with 90.7% for 1944, with 88.0% for 1943, with 88.4% for 1942, and with 99.0% for the corresponding week in 1941.

Paperboard production for the week ended June 9 was 93.0%, compared with 96.0% for 1944, with 92.0% for 1943, with 72.0% for 1942, and with 88.0% for the corresponding week in 1941.

Pulpwood

Pulpwood receipts in the Northeastern area, the WPB reports, rose from 608,000 cords to 726,000 cords in the first four months of 1945. Receipts in the Appalachian area declined 16% because of unfavorable weather. Shortage of woodsmen in the Pacific Coast areas hampered output. Total receipts, on roughwood basis, for the first four months of 1945 were 4,932,000 cords of domestic wood and 400,000 cords of imported pulpwood. This is a decline of 5.2% in 1945 below the like period in 1944.

Wood Pulp

Expectations of an easement in the tight wood pulp situation are widely reported. In commenting on relief through imports, the Department of Commerce states that it is generally recognized that Sweden is the only country, except Canada, in a position to supply substantial quantities of wood pulp during the remainder of this year. The American-Swedish News Exchange, the Department report adds, on May 25 stated that there is good reason to believe that Sweden is in a position to supply the United States with 1,300,000 short tons of pulp in the first 12 months, as well as meet export requirements of other world markets. Stocks of chemical pulp were reported at about 770,000 short tons, but current production has undoubtedly added to the stock pile.

Rags

Mill demand for cotton cuttings is reported heavy at this date. Prices continue strong. Many current reports indicate supplies are declining further below the steady demand for the papermaking grades. OPA has set a ceiling price of $3.50 on sales of new green herringbone twill cuttings.

A stronger demand for old cotton rags is reported this week. The major buying was in old whites, thirds and blues. Prices are firm at ceiling levels, with reports indicating supplies are under current demand.

Old Rope and Bagging

No important change in the old rope market has been reported this week. Demand for Manila rope continues to absorb all visible supplies. The price is firm at ceiling levels.

Scrap bagging is reported relatively quiet this week. Demand for the roofing grade continues steady at the ceiling price of $1.35.

Old Waste Paper

Mill demand for paper stock continues active at this date. Inventories of waste paper are increasing at the mills. Total receipts in April were, however, 703,000 tons; consumption, 704,000 tons and inventories 706,000 tons, indicating a decline in receipts of 0.04%; an increase in consumption of 8%, and an increase in inventories of 12.9%, in the first four months of 1945 from the like period in 1944.

OPA Amendment 13 to MPR 30-Waste Paper, effective June 21, 1945, simplifies the manifest provisions of that regulatory order, reducing details the shipper must observe. This applies only to waste paper baled for commercial shipments not to loose paper collected in salvage drives.

Twine

No change of importance has been reported this week in the twine market. Demand is seasonally active for some types of twine. Prices are relatively firm.

Kimberly-Clark Has New Revision Plan

APPLETON, Wis., June 18, 1945 — Kimberly - Clark Corporation, Neenah, Wis., last week announced a revised pension plan, known as the Kimberly-Clark Retirement Trust, administered by a board of trustees named by the directors of the corporation. The trustees are Cola G. Parker, Ernst Mahler, C. H. Sage, J. R. Kimberly and W. H. Clifford.

All persons connected with the corporation for 15 years or more of consecutive service are covered, upon reaching the age of 60 for women and 65 for men.

The revised plan has been made retroactive to January 1, 1944. It is built upon and includes the original plan of 1930, under which nearly 90 Kimberly-Clark people are drawing monthly pensions. The 1930 plan paid pensions on the basis of $1.25 per month, multiplied by total consecutive years of service, with a limit of $50 per month. This plan serves as the base of this year's enlarged plans, and all pensions authorized under it are continued. Maximum pension available under the new trust is $500 per month.

Military service or absence on certified leave does not break an employe's continuous record of service.

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and
GRAY-TINTED STOCKS

TECHNICAL INQUIRY IS INVITED

COLUMBIAN CARBON CO. • BINNEY & SMITH CO.
MANUFACTURER DISTRIBUTOR
41 EAST 42nd STREET • NEW YORK 17, N. Y.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 20, 1945.

BLANC FIXE—Prices on blanc fixe continue unchanged at prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand continues heavy. Production reported high. Allocation removed on February 27. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more 24 cents per pound; 2,000 pounds, 24½ cents per pound, less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point.

CAUSTIC SODA—Demand very heavy. Production large, but deliveries slow. Market tight. Shipments a little delayed by lack of manpower. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Military and all essential requirements heavy. Car shortage hampers deliveries. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—Offerings and sales light. The OPA price on "G" gum rosin is $5.79 per 100 pounds in barrels, at Savannah. "FF" rosin is established quoted at $5.75 per 100 pounds, in barrels at New York. Average price on seventy per cent gum rosin size is $5.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Market is tight. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market is reported steady. Offerings fair at this date. Demand continues heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is favorable. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur contines heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at mines. Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	@	—
Sheets	69.00	@	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Lt. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
65% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@	$13.9
No. 2 Glossy Coated	12.40 "	14.0
No. 3 Glossy Coated	11.60 "	12.2
No. 4 Glossy Coated	11.15 "	12.7
No. 1 Antique (watermarked)	10.25 "	11.7
No. 2 Offset	9.60 "	11.0
A Grade E. F.	9.35 "	10.7
A Grade S. & S. C.	9.60 "	11.0
B Grade E. F.	8.85 "	10.1
B Grade S. C.	9.10 "	10.3
C Grade E. F.	8.55 "	9.7
C Grade S. C.	8.80 "	10.0
D Grade E. F.	8.25 "	9.3
D Grade S. & S. C.	8.50 "	9.7

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich *72.00 @	62.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weigh
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50% 80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weigh
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags

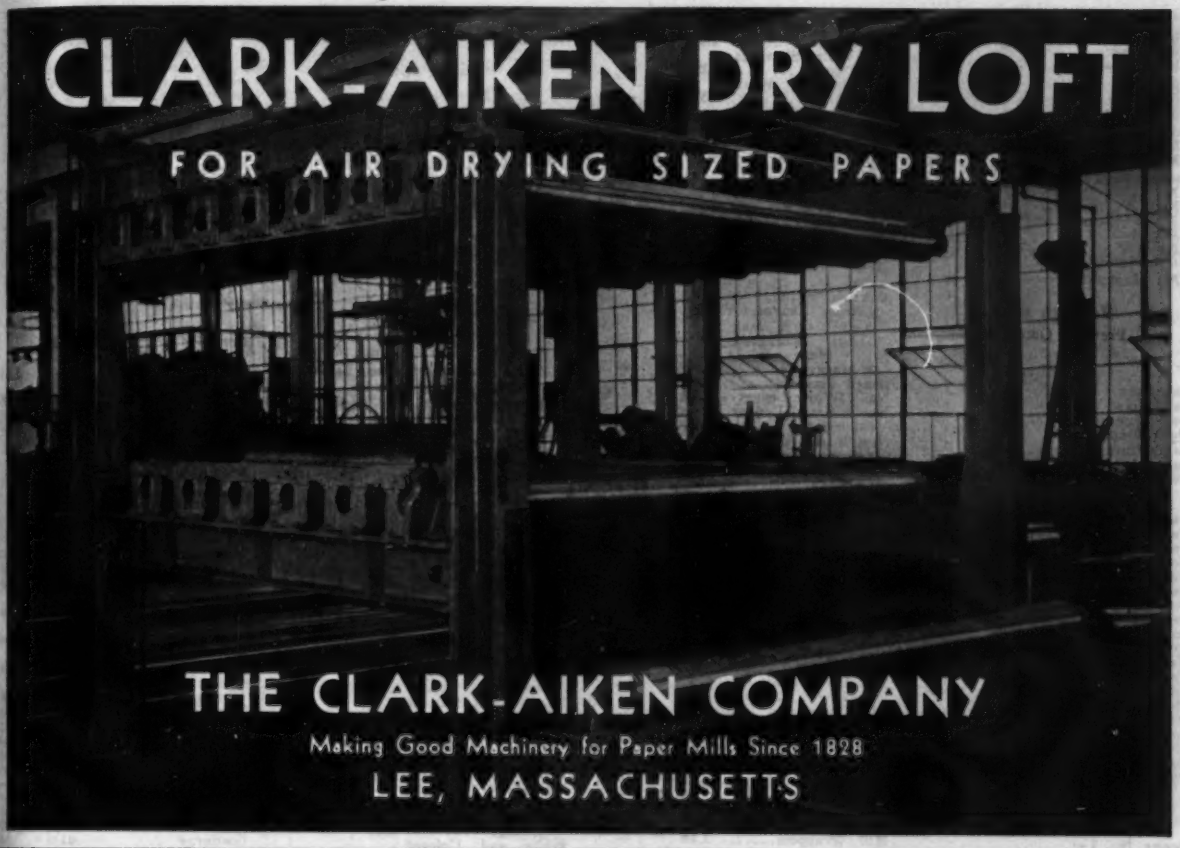
(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices

CLARK-AIKEN DRY LOFT

FOR AIR DRYING SIZED PAPERS



THE CLARK-AIKEN COMPANY

Making Good Machinery for Paper Mills Since 1828

LEE, MASSACHUSETTS

ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

Old Rags

White, No. 1—			
Repacked	*3.80	●	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Seeding Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

Pre-War Quotations

All Prices nominal

New Rags

New Dark Cuttings	2.25	●	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	●	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	●	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	●	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.36	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.15	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¾
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¾
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¾
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 3—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.10
No. 1 Clean bright—			
Sisal Strings			.04
No. 2 Clean bright—			
Sisal Strings			.03
Sisal Jute	.02½	"	.03¼
Scrap—			
No. 1	3.25	"	3.40
No. 2	1.75	"	1.90
Wool Tares, bur	4.00	"	4.25
Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—
No. 1 New Light Burlap	3.90	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings			

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	●	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	●	2.90
Sisal Rope No. 1	*4.75	"	
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	
Soft Jute Rope	4.50	"	5.00
Jute Car pet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3	"	3.25
South American	—	"	3.25
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25		
Aust. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.70
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	●	.04½
Fancy Percales	.04¼	"	.04¾
New White No 1	.06¾	"	.07
New Light Flannelettes	.03¼	"	.03½
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06¾
Underwear Cutters, Unbleached	.05¼	"	.05½
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03½
Corduroy	.03¼	"	.03½
New Canvas	.06½	"	.06¾
U. S. V. D. Cuttings	.06½	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—Repacked	3.80	●	—
Miscellaneous	3.20	"	—
White No. 2—Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	1.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	1.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
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No. 1 Roofing Rags	1.35	"	—
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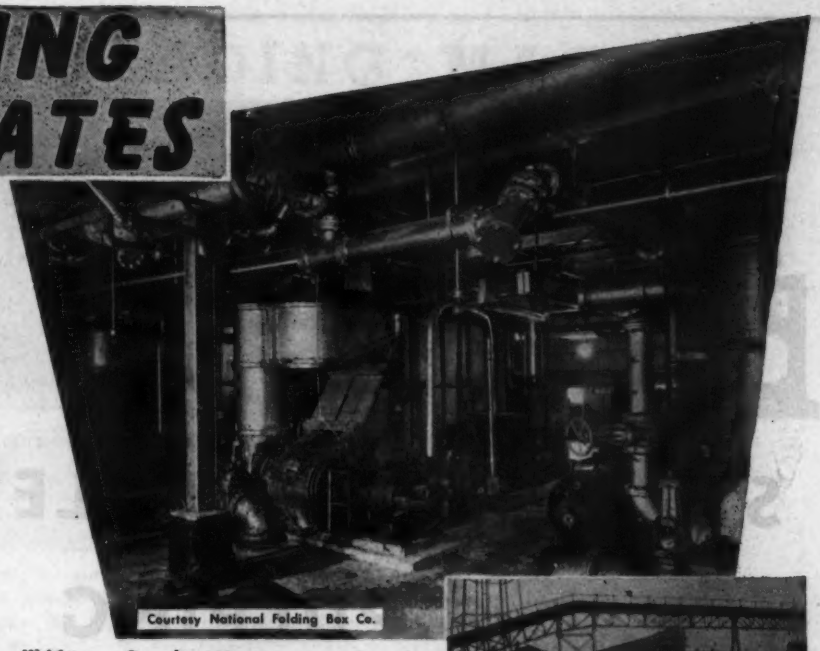

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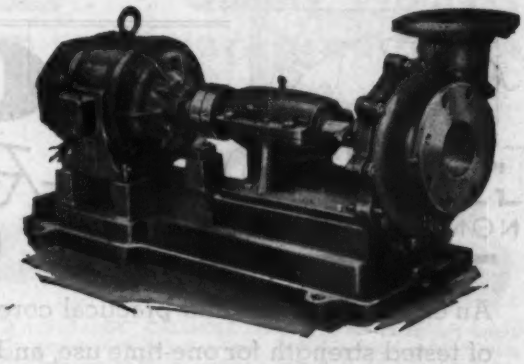

What do you look for in a pump? You have a job to do, and you're in the market for a pump *tailored* to the job. Where would you go for that kind of pump?

Representative users in diversified industries recommend FREDERICK pumps . . . *guaranteed* to do the work for which they are sold.

No stock pump—not a "do-it-all"—your FREDERICK pump is built from a basic design with *your* requirements in mind, to perform the specific task you have for it to do in your own plant.

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Our engineering consultation is available without obligation . . . let us tell you more about FREDERICK pumps—*designed* to to meet the operating conditions of *your* industry.

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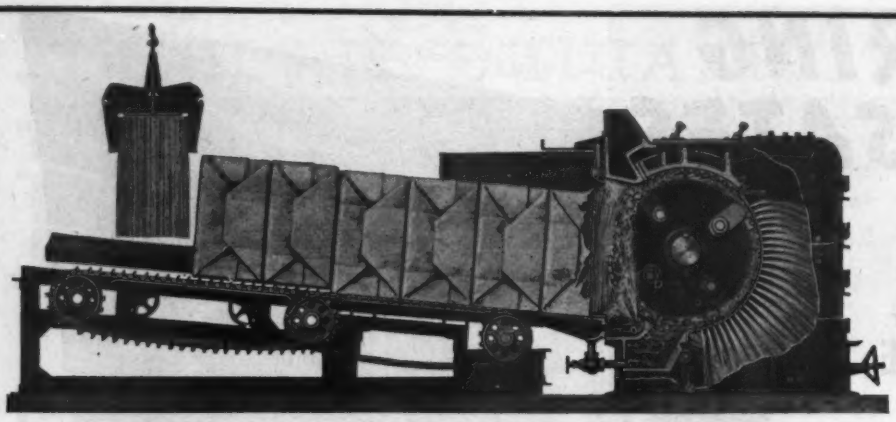

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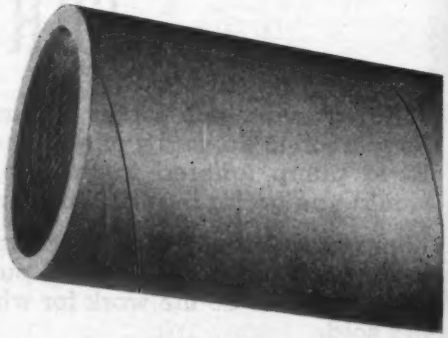
An extremely tough and practical core of tested strength for one-time use, and priced accordingly. We have been able to maintain prewar quality standards and adequate production on this core with which to serve a wide range of uses where practical to use this type.



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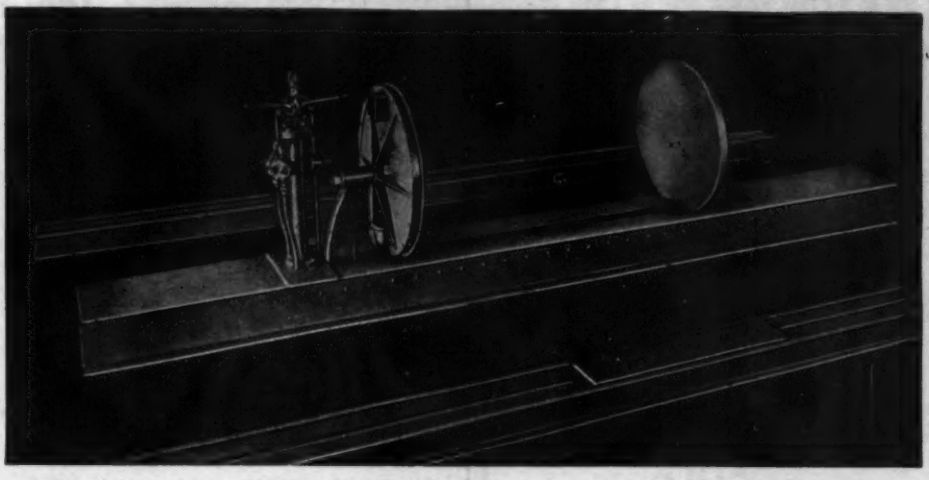

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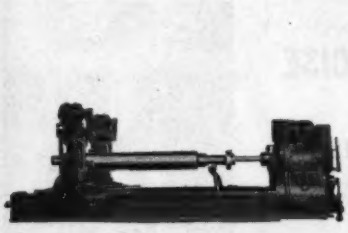

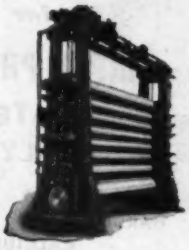

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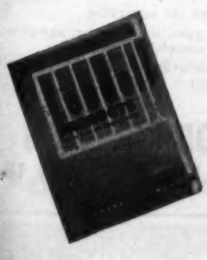

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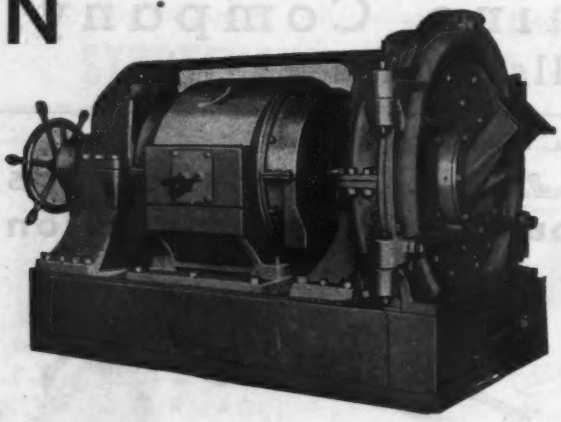

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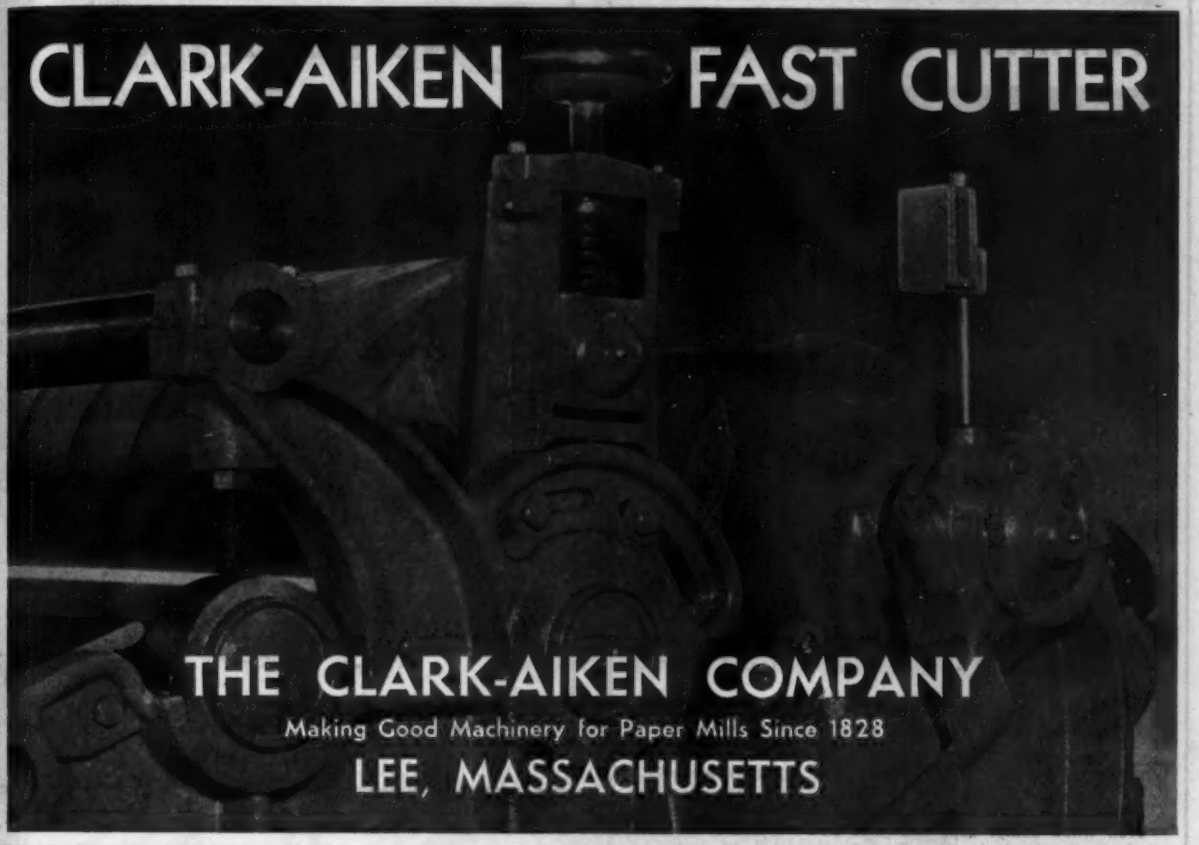

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Fig. 89
Bronze Globe Valve
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You will find that these valves operate easily . . . close tightly . . . give dependable, lasting service. Fig. 89 illustrated is typical of Kennedy Bronze Globe Valves . . . strong . . . designed to speed-up piping jobs . . . simplify operation . . . keep maintenance costs low. Available disc types include bronze, renewable composition, regrinding, full way, and plug type for steam pressures up to 300 lbs. Write for complete catalog.

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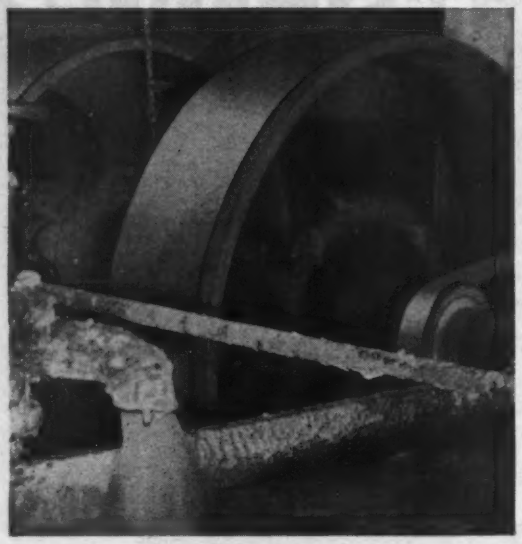

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A user of Tannate Belting reports a 33 1/3% increase in output, longer life of the belt and a considerably lower chipping cost.

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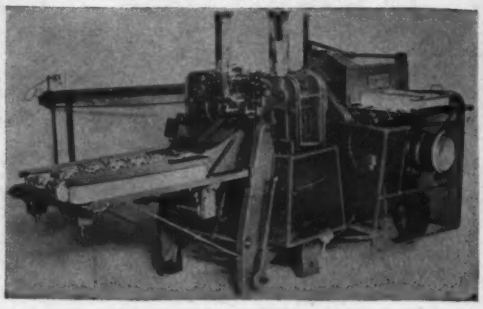

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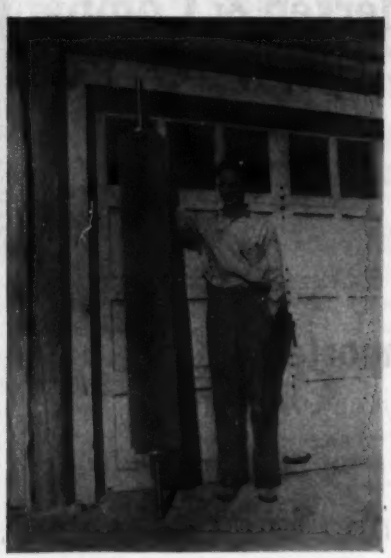
THIS 144" BRUSH RUNS TRUE . . . .



This brush, one of the largest employed in paper making is 144" long. It is used to sprinkle tissues.

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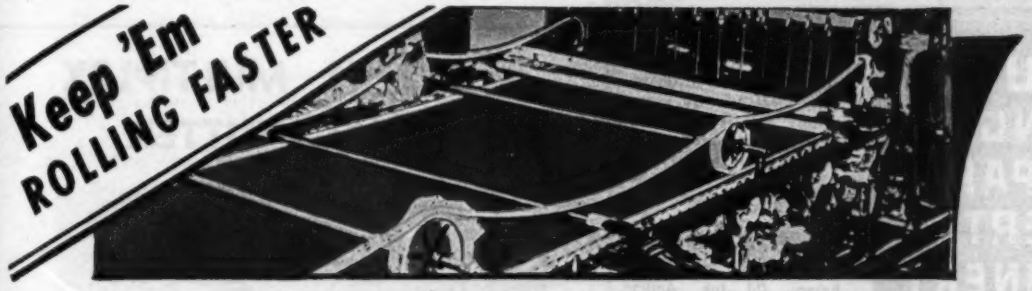

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When you clean a felt, you should do much more than remove the dirt deposit. Removing the dirt does not necessarily restore the nap, or give you a soft, absorbent felt.

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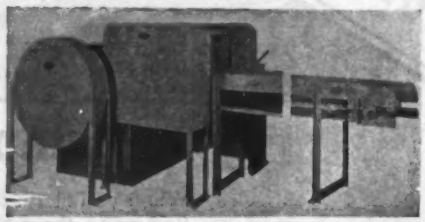

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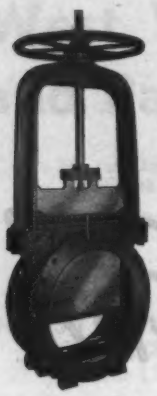

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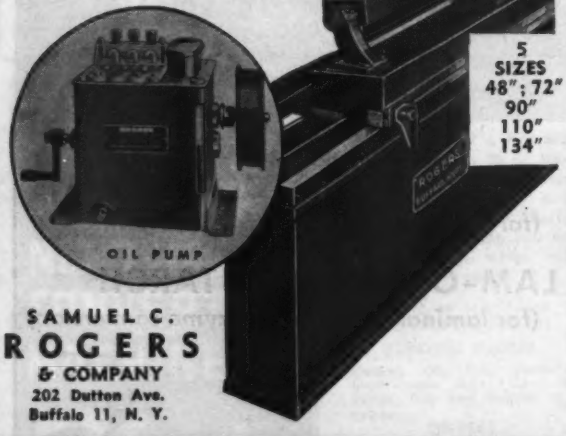

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PAPER AND BOARD

H. G. WEBER & COMPANY

Builder of High Speed Bag Machines

Grocery, Duplex, Coffee, Flour, Cellophane Satchel Bottom, Tuber & Bottomers Automatic Compensating Device.

KIEL WISCONSIN

PULP MILL MACH'Y FINISHING ROOM MACH'Y
FRICTION CLUTCHES

THE MOORE & WHITE CO.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.

Jordan Shell and Plug Fillings
TRADE-MARK
POSITIVE
Reg. U. S. Pat. Off.
High Speed Disc Refiner
THE BAHR BROTHERS MFG. CO.
MARION, INDIANA, U.S.A.

MISCO "C"

THE CORROSION RESISTANT ALLOY

CAST • ROLLED • FABRICATED

for all equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

WATERBURY TOOL

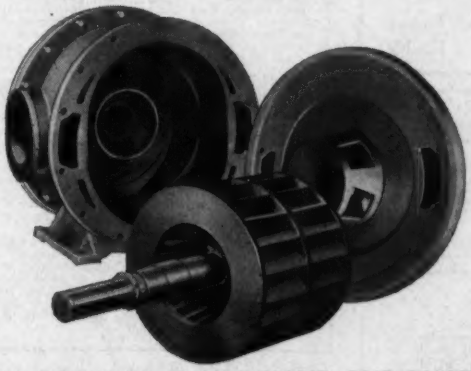
Division of Vickers Incorporated

VARIABLE SPEED HYDRAULIC TRANSMISSIONS

FOR WINDERS, CUTTERS, VARIABLE SPEED LINES

WATERBURY 91, CONNECTICUT

SIMPLICITY



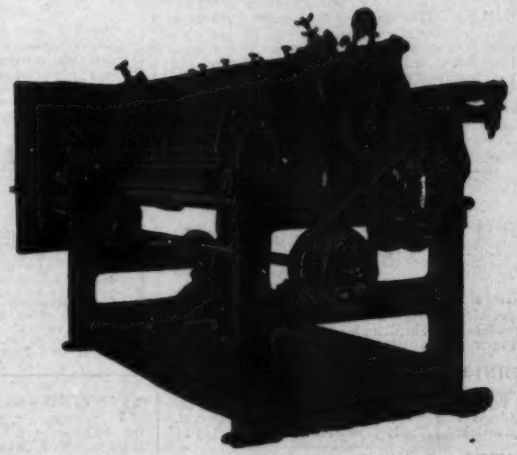
NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

MODEL 28

ROLLER BEARING CUTTER



HAMBLET MACHINE CO.
LAWRENCE, MASS.

MAKERS OF
SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS
CUTTER KNIVES, PATENT TOP SLITTERS.

For SHOWER PIPES—*Call Headquarters!!*

Bulletin 134 SANDUSKY FOUNDRY & MACHINE CO. Sandusky, Ohio

The CLEARING HOUSE

HELP WANTED—6c a word. Double rate for heavy face type. Minimum charge $1.25.
SITUATIONS WANTED—6c a word. Double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—6c a word. Double rate for heavy face type. Minimum charge $1.25.
WANTED—6c a word. Double rate for heavy face type. Minimum charge $1.25.
OPPORTUNITIES—6c a word. Double rate for heavy face type. Minimum charge $1.25.

All classified advertisements are payable in advance.
Address replies to advertisements appearing under Box numbers in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York, N. Y.

HELP WANTED

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston, Mass.

Positions Now Open

Assistant to general manager, college graduate, $5,000 year to start
Master Mechanics
Man for process control and inspection work, college graduate qualified to work up to be mill superintendent
Finishing room superintendent for cellulose wadding plant
Technical director, chemists and chemical engineers
Foreman wood handling operations
Tour boss (several)
Mechanical engineering graduates (several)
Purchasing agents
Draftsmen and designers
Superintendent chip board mill
Superintendents roofing felt mills (two)
And many others

We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. J-21

MACHINE TENDER for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-293 care Paper Trade Journal. TF

WANTED—Young Chemist with some pulp paper laboratory experience for testing and development research assistance. Essential war industry in South. Give training and experience, age, draft status, salary expected. Replies confidential. Address Box 45-351 care Paper Trade Journal. J-28

WANTED—Paper Bag Machine Adjuster. High hourly rate, over time. Post war employment. State experience. Address Box 45-343 care Paper Trade Journal. J1-5

HELP WANTED for New England Book and Specialty Mill—Fourdrinier Machines:—6 Backtenders, 6 Thirdhands. Address Box 45-352 care Paper Trade Journal. J1-19

TECHNICALLY TRAINED Man familiar with paper industry, wanted for chemical sales. No travel required. Splendid opportunity for man 28-35. Address Box 45-351 care Paper Trade Journal. State availability. Salary desired. J-21

WANTED—Chief Draftsman by old established New England company manufacturing heavy paper mill machinery and employing 250. Excellent post war future. Give details of education. W.M.C. Rules apply. Address Box 45-363 care Paper Trade Journal. J-21

WANTED—Art Director; Must prove executive ability and exceptional creative talent, expanding organization, experience necessary in retail package design, must be well versed in printing. Fully outline qualifications and name salary. Man or woman. Address Box 45-361 care Paper Trade Journal. J-28

WANTED—Experienced Operator for Hamblet Sheeting Machine to take charge of sheeting department in New York City. State experience and salary desired. Address Box 45-360 care Paper Trade Journal. J-21

PLANT MANAGER—Hand made case liner and bag manufacturing plant, established business. Philadelphia Area. State experience and qualifications. Replies strictly confidential. National Waterproofing Co., Front and Beckett Sts., Camden, New Jersey. J-21

WANTED—Draftsman for large board mill in mid-west. Permanent position with excellent post war future. Give age, education and experience. Address Box 45-368 care Paper Trade Journal. J-28

SALARIED POSITIONS — This advertising service of 35 years' recognized standing negotiates for high salaried supervisory, technical and executive positions. Procedure will be individualized to your personal requirements and will not conflict with Manpower Commission. Retaining fee protected by refund provision. Identity covered and present position protected. Send for details. R. W. BIXBY, INC., 117 Delward Bldg., Buffalo, 2, N. Y. tf

HELP WANTED

"A company of substantial position in the industry wishes to know of several young men, chemists and chemical engineers, of high order of technical education and of some proved ability in research and development, who are interested in making professional careers for themselves limited only by their own abilities.

"Unexpired terms in the armed services are no deterent to a post-discharge arrangement.

Address Box 45-335 care Paper Trade Journal. JL-19

Wanted paper salesman to represent a paper converting mill in eastern Pennsylvania territory. We prefer one who has had some experience with the paper jobbing trade, and who resides in or about Philadelphia. In replying, please state qualifications. Address Box 45-345 care Paper Trade Journal. JL-5

WANTED

Mechanical Engineer by old established New England Company manufacturing paper mill machinery and employing 250. Applicant should be familiar with manufacture of heavy machinery, and capable of devising improved methods. Position offers permanency and exceptional opportunity for development. Living conditions present choice of small attractive city or pleasant country supplying unusual recreational and cultural advantages. W. M. C. Rules apply. Address Box 45-362 care Paper Trade Journal. J-21

WANTED—Machine Tenders, Back Tenders, Windermen, Laster Mechanic and Millwright for cylinder machine mill. Reply to Mr. T. J. Russell, Mill Manager, Sangamon Paper Mills, Eaton, Indiana. J-21

SUPERINTENDENT for finishing department in large modern midwestern paper converting plant. Must be expert in laminating and coating of paper, plating, stack and friction calendering, and have a good chemistry background in paper and related materials. Knowledge of water-proofing of paper and application of lacquer and plastic coatings necessary. Address Box 45-210 care Paper Trade Journal. TF

WANTED—Board Mill on Pacific Coast needs a backtender and a third hand to fill vacancies resulting from promotions. Good wages and pleasant working conditions. Permanent jobs and good chance for advancement. All replies held in strict confidence. Might be able to use a machine tender. Address Box 45-330 care Paper Trade Journal. J-21

TOUR BOSS—Experienced on fine grades of paper including Bonds and Ledgers. Able to assume full duties of tour boss. Mill located in Eastern Pennsylvania. Give resume of experience in this field. Address Box 45-313 care Paper Trade Journal. J-21

WANTED — Licensed Steam Engineer. One capable of handling maintenance and operation in paper mill on Pacific Coast. Apply in own handwriting stating experience, references and salary wanted. Address Box 45-244 care Paper Trade Journal. TF

WANTED—CHIEF CHEMIST for pulp and paper mill located on Pacific Coast. Apply in own handwriting giving references, experience and other pertinent information. Address Box 45-243 care Paper Trade Journal. TF

HELP WANTED — Back Tenders, Machine Tenders. Steady positions. Write 705 Trenton Trust Bldg., Trenton, New Jersey. J-21

HELP WANTED

SALESMAN for large folding carton and specialty manufacturer. Unusual opportunities. Give full qualifications, age and draft status. Replies held in strictest confidence. EMPIRE BOX CORPORATION, GARFIELD, N. J. A-2

SITUATIONS WANTED

CHEMIST,
CHEMICAL ENGINEER, Ph.D.
(Cellulose and Organic)

with 10 years experience in operations in Sulphite, Sulphate, Soda and Rag pulp mills and bond, book, wrapping, glassine, cigarette and rag papers. Last five years in control and development of process and equipment. Special studies and operation on cooking, bleaching stock preparation of above pulp grades. Qualified in development and operation of Sulphite and Kraft process heat and chemical recovery and equipment. Chlorine and alkali plant experience and control. At present employed, but desire change as Technical Director, Chief Chemist, Supt. Best of credentials.

Address Box 45-337 care Paper Trade Journal. J-28

DEVELOPMENT CHEMIST—
SALES SERVICE ENGINEER

with proven ability desires position with progressive organization as research and/or sales associate. Has fundamental and practical knowledge of paper making, converting, and specialty treatments. Conscientious, creative and aggressive. Exceptional record in new product development and technical selling. Address Box 45-350, care Paper Trade Journal. JL-5

PRODUCTION MAN—32. Thoroughly experienced in production, supervision and merchandising of envelopes, papeteries, fine stationery. Available at once. Address Box 45-324, care Paper Trade Journal. J1-5

FOREMAN FINISHER—Twenty years diversified experience, proficient operator and instructor, clerical, scheduling, warehousing, shipping, inventories, etc. Resume on request. Address Box 45-318 care Paper Trade Journal. J-28

PAPER CONVERTING FOREMAN—18 years experience paper cutting, straight and die cutting. Many years successful handling of men. Seeks position Metropolitan Area. Address Box 45-276 care Paper Trade Journal. J-28

TOUR BOSS on folding grades or linen. Middle aged. Best of references. Will run machine temporarily. Address Box 45-340 care Paper Trade Journal. J-21

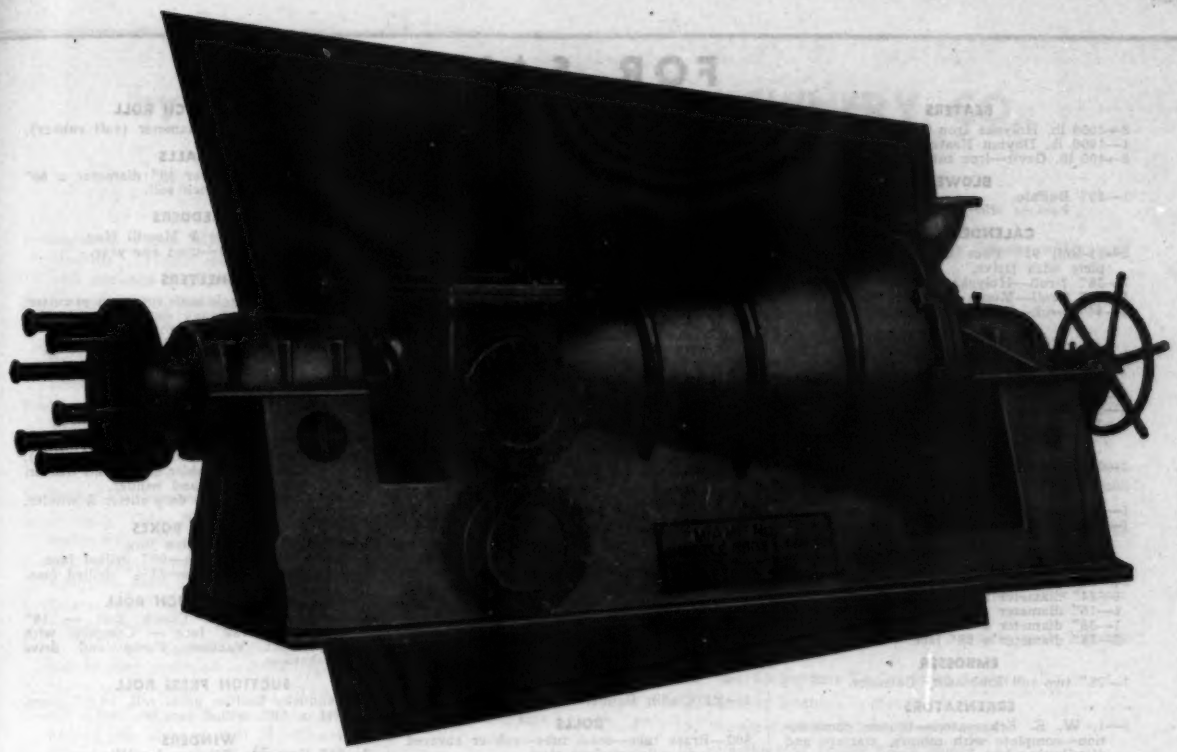
14 YEARS paper converting experience, thoroughly familiar with manufacture of wax-oil paper, aniline printing, envelopes, papeteries. Post war ideas. Chemical experience. Address Box 45-325 care Paper Trade Journal. J-28

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-355 care Paper Trade Journal. J1-5

GENERAL SUPERINTENDENT — One or more mills. Now employed, but available in 30 days. Prefers high grade fourdrinier papers. Familiar with and have installed deinking systems. Good organizer. Technical training. Replies confidential. Address Box 45-348 care Paper Trade Journal. J-28

BEATER ROOM SUPERINTENDENT and expert color man, who knows beating of rag and sulphite papers, is available on short notice. Now employed. Address Box 45-349 care Paper Trade Journal. J-28

SALES EXECUTIVE—High type, university education, broad background, all phases, both merchandising and manufacturing in whole pulp and paper industry. Well able to handle any assignment. Age 44. Address Box 45-342 care Paper Trade Journal. J-28

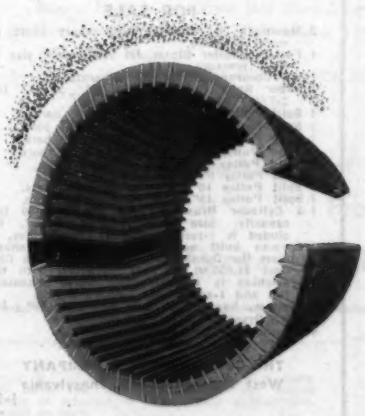


ARE YOU AT THE MERCY OF WORN OUT JORDANS?

We don't put this question to worry you. We put it in order to jar you into the realization that old or worn out jordans are a positive production hazard.
How about eliminating that hazard—by installing Miami jordans?

Miami jordans are more rugged, more rigid, more durable than other jordans.
Miami jordans are engineered to the particular refining job to be done—ten different types and sizes of Miamis from which to choose.

Why not order now and get a replacement, or a spare, ahead of . . . rather than after the breakdown.



Bulldog filling for any make or size jordan built.

X66 Plugs—by far the strongest plug ever built.

SHARTLE BROS. MACHINE COMPANY
MIDDLETOWN, OHIO

Dilts

Dilts Machine Works, Fulton, New York—Divisions of Black-Clawson Co., Hamilton, Ohio.

FOR SALE

BEATERS
3—2000 lb. Holyoke Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

BLOWER
1—50" Buffalo.
Various other sizes.

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—72" 2-roll—Moore & White.
1—84" 5-roll—Black-Clawson.

CENTRAP
1—Shartle Brothers Centrap.

CYLINDER MOULDS
1—[illegible]" Diameter x 96" Face.
2—30" diameter x 72" face.
3—30" diameter x 74" face.

DRIVES
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—#6 Reeves Drive (practically new).
1—Pulmax Drive.

DRYERS
1—48" diameter x 94" face.
24—36" diameter x 82" face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSATORS
3—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREENS
2—8 plate Flat Screens.
1—18 plate Flat Screen, with scraper.

JORDANS
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor—requires use of 400 H.P. motor.
1—Smith & Winchester.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.

REFINERS
2—#1 Claflin Refiners.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

RUBBER COUCH ROLL
1—72½" Face x 9" diameter (soft rubber).

SAVEALLS
1—Shartle Bros. decker 36" diameter x 60" face, including couch roll.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS
1—110" Horne single knife rotary sheet cutter.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—36" Koegel slitter and winder.
1—44" Langston heavy duty slitter & winder.

SUCTION BOXES
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

SUCTION PRESS ROLL
1—Sandusky suction press roll, 14 5/16" diameter x 68" drilled face.

WINDERS
2—65" Cameron Tensions for Winders.

J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey
TEL. BIGELOW 3-3720 J-21

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

SITUATIONS WANTED

BOARD MILL MANAGER—Available July 1st. Capable of constructing as well as operating. Splendid education. Unimpeachable character, Can build smooth working organization. Seeks large assignment. Address Box 45-347 care Paper Trade Journal. J-28

BOARD MILL SUPERINTENDENT—Available immediately; 15 years experience in two large two-machine mills manufacturing all grades of folding board and test liners; age 44; fully qualified to handle help; full particulars upon request. Address Box 45-366 care Paper Trade Journal. Jl-12

FOR SALE

FOR SALE

20 dryers in very good condition, 5 ft. dia. x 170" face with gears 110 teeth 2 pitch, 5 to 7" face, also 23 felt rolls 12" dia. x 175" face and 16 frames.
1 Mack trailer, model 16 ST. serial number 2x2147, tank size 3250 gallons. Oval cross section 15 ft. long steel tank, 3" cork insulated.
1 Combination top and bottom Bliss stitcher for sealing boxes.
1 Bliss double head assembly stitcher, new in 1936.

FRANK H. DAVIS CO.
175 Richdale Ave., Cambridge 40, Mass.
J-21

FOR SALE—44" Seybold Cutter, guaranteed to be in good operating condition. Address Box 45-369 care Paper Trade Journal. J-21

FOR SALE

FOR SALE

One large Breaker Beater complete
One small beater complete
Revamping mill
Recently installed new Dilts Hydrapulper
Many items for sale, too numerous to mention.
1—30" Diameter x 90" Face cylinder mold.
1—8 x 8 Shartle Duplex plunger stock pump
1—New pair cast steel double suspension spring type beater bearings for 8" diameter journal —Noble & Wood beater roll. Never used.
1—New reinforced design lighter beam for 8" diameter journal—Noble & Wood beater roll. Pattern #863. Never used.
1—Used old style lighter beam for 8" diameter journal Noble & Wood beater.
3—200 KVA—33000—2300/4000 volts transformers.
1—250 H. P. slip ring motors & controls—450 R. P. M.—3 Bearing base & pulley.
60—92" Face steel dryer felt rolls—1-7/16" journals.
1—20" Face cast iron taper pulley—2-15/16" bore taper 31" x 29½".
4—36" Diameter x 63" Face dryers.
1—6" to 10" Cox & Sons Pipe threading machine.
1—48" x 48" Noble & Wood beater roll with filling installed.
1—40" Noble & Wood impeller for circulation stock in beater.
A visit to the mill would prove profitable. See our superintendent, Mr. O. P. Fussell at our plant in Walloomsac, New York.

WALLOOHSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York
TF

FOR SALE—ONE CALENDER STACK
6 Roll, Stack 110" face with drive complete
Bottom Roll—20" diameter
1 Roll—14" diameter
3 Intermediate Rolls—10" diameter
1 Top Roll—10" diameter
These Frames will accommodate 3 additional 10" rolls.
Address Box 45-365 care Paper Trade Journal. J-21

FOR SALE

2 Mammoth Jr. Jordans with short shaft for motor coupling.
1 Foster Wheeler Steam Jet Air Pump, size X-135# pressure.
1 10" Cochrane Steam Oil Separator.
1 Taper Split Pulley 25" x 27" x 24" face 2-7/16" bore.
1 Split Pulley 9" x 36" x 5-15/16" bore.
1 Split Pulley 8½" x 50" x 5-13/16" bore.
1 Split Pulley 12" x 60" x 5-15/16" bore.
1 Solid Pulley 10" x 36" x 1-15/16" bore
1 Solid Pulley 9" x 28" x 2-7/16" bore.
1 Split Pulley 9" x 22" x 3-7/16" bore
1 Split Pulley 10" x 24" x 2-15/16" bore.
1 Split Pulley 18" x 36" x 3-15/16" bore.
1 3 Cylinder Brunswick Ice Machine, 30 tons capacity. Size C-353, Serial #7337. Included is 1-receiver and 1-oil separator.
1 German built embossing machine. Purchased from the Dornbusch Agency, New York City. Cost $1,650.00 in 1925. Included with this machine is 1-Herringbone design embossing roll and 1-spider web embossing roll.
1 Economy hand baler, bale size 20" x 36" x 45".
8 Horn Dryers, 92" face, 36" dia.
4 Downingtown Dryers 92" face, 36" dia.
(No frames or gears included)

THE GLASSINE PAPER COMPANY
West Conshohocken, Pennsylvania
J-21

FOR SALE

1—Complete 98" Fourdrinier Paper Machine with 26 Dryers, 48" diameter x 96" face, including auxiliary equipment. Additional details on request.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Telephone Bigelow 3-3720

by JACK ROSS PAPER MACHINERY CO.

17 Porter Avenue, Newark 8, N. J., Waverly 3-5675

1—Improved Paper Machinery Company 3 roll Hydraulic Wet Machine. Cylinder Mold 36" diameter 84" face. Complete with enclosed drive. Prints and photos on request. Used 1 year.

2—Pusey & Jones Horizontal Digesters. Welded equipment with Logan Circulators. 24' high and 7' diameter. 125# working pressure. Prints on request.

1—Guyton-Cumfer Saturator. Tank 50" wide. 5 gates complete. Prints on request.

1—Waterbury Hydraulic Variable Speed Transmission. Size 50—Type C. Maximum HP 80. Maximum RPM 400.

1—Moore & White Flat Screen. 16 plates 12" x 24" .015 cut.

1—Moore & White Flat Screen. 20 plates 12" x 24" .015 cut.

1—Packer Flat Screen. 10 plates 12" x 42" .015 cut.

1—2" to 6" Oster Pipe Threading Machine. Direct connected to motor 440-3-60.

2—#3 Vertical Reeves Drives totally enclosed—ball bearing equipped. Ratio 5:1. Used year and a half.

4—Driers—112" face x 48" diameter complete with 2 deck frames, gears, etc.

1—A. D. Wood Saveall—cylinder—60" face by 48" diameter—ball bearing equipped—rebuilt—specifications on request.

1—No. 1 Voith Pulper—capacity 20 tons per day—requires 20 h.p.

1—42" Liner and combining machine. Fourteen 6" diameter steam heated rolls and one drier 24" diameter.

3—Improved Paper Machy. Corp. #2 Knotters Bronze fitted. Good condition. Prints on request.

2—14" x 20" Connersville Vacuum Pumps. These pumps are fully rebuilt.

3—12" x 18" Connersville Vacuum Pumps. These pumps are fully rebuilt.

1—Downingtown 2500 lb. Iron Tub Cyclone Beater. Beater rolls 60" face, 72" diameter. This beater is in excellent condition, having been in operation less than 2 years. Prints on request.

2—Holyoke Platers—2 roll, 36" face x 18" diameter—complete with drive.

1—Nichols-Herreshoff Lime Kiln—vertical 65 tons capacity. Prints on request.

1—72" two drum Pusey & Jones Slitter & Winder will rewind 40" diam. rolls.

1—56" undercut trimmer—2 spare knives.

1—100" two drum Warren Slitter & Winder.

1—100" Two Bowl Reel—Bowls 20" diam.

1—E. D. Jones Standard Jordan with fast coupling and extended base for direct connection to motor.

1—Farrel Roll Grinder will take rolls 28" diam. 18' long. Motor equipped. 2—10 h.p. Motors. 1—15 h.p. Motor—Excellent condition. Photos on request.

1—Williams #30 type G. A. Bark Hog with 125 h.p. Synchronous motor. Ball bearing equipped and new spare parts—used one year.

1—Sumner Disc Barker—72" diam. disc. Anti-friction bearings. Direct connected 30 h.p. motor. Used 5 months.

1—140" two drum Warren Slitter & Winder.

40 Driers—96" face x 28" diameter complete with 2 deck frames, gears and bearings.

1—Sturtevant Bale Pulper with conveyor complete with 150 h.p. motor and starter.

8—10" x 20" Shartle Brothers Triplex Stock Pumps.

1—12" x 20" Shartle Brothers Triplex Stock Pumps.

1—8" x 18" Shartle Brothers Triplex Stock Pumps.

1—8" x 10" Worthington Triplex Stock Pumps.

3—12" x 12" Goulds Triplex Stock Pumps.

2—6" x 8" Beloit Centrifugal Stock Pumps.

All above pumps in excellent condition.

2—1000 lb. Horne Iron Tub Beaters.

1—1200 lb. Holyoke Wood Tub Beater.

1—100" Proctor & Schwartz festoon drier—complete.

1—Trimbey Pulp Screen perforations. 090—30 tons capacity.

18 Driers—36" diameter—82" face—2 deck frames, gears and bearings.

6 Driers—36" diameter—82" face.

4 Sets of Press Rolls 15" diameter—87" face.

1 Set of Size Press Rolls—84" face—16" diameter.

Cash purchaser of all types of paper, pulp and converting equipment.

From single items to complete plants.

Write, telephone or wire whatever you have for sale.

MOBILE STORAGE

15—50 ft., 50-Ton, Steel Automobile Box Cars. 4347 cubic foot capacity. Excellent for mobile storage or transfer of light bulky commodities. Prompt delivery.

IRON & STEEL PRODUCTS, INC.
40 years' experience
13420-A S. Brainard Ave., Chicago 33, Ill.
"ANYTHING containing IRON or STEEL"
J-21

FOR SALE

1—72" 10A Cameron
1—No. 8, Model A Cameron, 84"
2—No. 6 Nash pumps in good operating condition, new in 1939
6—Tolhurst extractors, new in 1932
1—86" Warren winder
2—Mid West Fulton iron tub high speed beaters, excellent condition, with rolls 61 x 60", new in 1928

FRANK H. DAVIS CO.
175 Richdale Ave., Cambridge 40, Mass.
J-28

FOR SALE—DRYERS

40 Dryers 36" x 68" complete with triple deck frames, gears and packing boxes.

40 Dryers 36" x 84" complete with double deck frames and gears.

1 Dryer 48" x 120" face.

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y.
J-21

FOR SALE—300 lb. Valley high speed beater, wood tub. Good condition. American Lace Paper Company, 4425 N. Port Washington Ave., Milwaukee, 12, Wisconsin. J-21

FOR SALE

New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
S-6

FOR SALE

One 36" Waldron Reeling Machine—One 36" Brush Coating Machine, 1 Rotary & 6 Vibrator Brushes with Lay Box, Appr. 340 Ft. Conveyor Belt.—1 Cast Iron Kettle 20" x 24"—Battery of 4 Waterville Color Grinders complete with attachment for two more heads.—One 39" Dampening Machine. —1 Copper Tank, Zinc lined appr. 35 gallons with agitator, no motor.—Located in East.

Address Box 45-353 care Paper Trade Journal. J-21

FOR SALE

FOR SALE

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1—10"x20" Beloit Triplex Stock Pump.
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3—Beloit Triplex Plunger Stock Pumps, sizes 8" x 12", 9" x 12" and 10" x 10".
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Narragansett Coated Paper Corp.
Pawtucket, R. I.
J-21

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4—Dryers 48" x112", journals about 6" dia.
20—Dryers 60" x 170", with bearings, gears, in excellent condition.
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150	Westgh.	600 RPM	440/220

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1—15" x 70" R.C. Press Roll.
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2—18" x72" R.C. Press Rolls
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1—Brass Breast Roll 20" dia., .96" face equipped with anti-friction bearings.
3—Brass covered Squeeze rolls 12" dia. 72" face with anti-friction bearings.
All rolls reconditioned and guaranteed.

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Fulton, N. Y.
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1—10" x 20" Beloit Triplex.
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J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Covel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Inc.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Ditz Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. B. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Ditz Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Ditz Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Posey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Posey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Ditz Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Posey & Jones Corp.
Rosblan Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shezango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Ditz Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Ditz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STAINLESS STEEL
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

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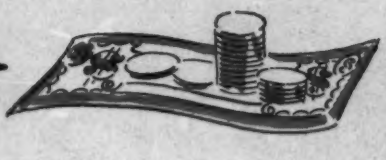
Trade this for this ; save and 

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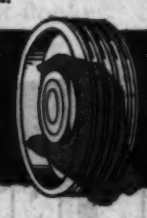
"MAGIC-GRIP"  SHEAVES

COMPRESSOR SPEEDED-UP 20%

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